User Acceptance Evaluation of E-Government Services, Impact of Unified Approach Framework on The Government Cloud

Sultanate of Oman as a Case Study; Government and Citizens Perspectives

Al Noaman AL SHAIDY

Submitted for the degree
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Department of Computing
Faculty of Engineering and Informatics

University of Bradford

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Al Noaman Mohamed Khamis AL SHAIDY

Submitted for the degree
Of Doctor of Philosophy

Department of Computing
Faculty of Engineering and Informatics

University of Bradford

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Abstract

Oman has adopted e-government services, but according to the United Nations E-Government Development Index classification, such services are not fully utilised. E-government classification of Oman shows a lack that motivated this research. The aim is to provide a framework that can help the Omani government to better implement e-government services. As a result, Oman classification is expected to be improved. Such framework may also help similar developing countries in implementing their e-government services.

This work aimed to address both; government and citizens prospective, also aiming to help conducting a sold research a good implementable framework. Therefore, an interview with 21 government participations from different institutions was conducted followed by citizens that attracted 400 qualified responses. The research process has led to the suggestion of using another approach of e-government services, the unified e-services portals.

The outcomes of this research show; both government and citizens are in favour of using unified definitions in portals. In addition, a proposed framework is presented based on supported findings that is believed to better utilising e-government services hence leading to improve ranking. It is also believed that the UN assessing committees would benefit from the unified approach. Simply, it unifies the definition of each service based on the published academic definitions and work.

The evaluation of the proposed framework is outside this research and can be addressed by a further research as recommended. Implementing the unified approach portals is another front that attracts implementation and evaluation.

Declaration

I hereby declare that this thesis has been genuinely carried out by myself and has not been used in any previous application for a degree. Any valuable participation of others in this thesis has been acknowledged where appropriate.

Al Noaman M K AL SHAIDY

Dedication

In memory of my father who was looking forward to seeing this achievement and share with him these moments, but he has preceded me to the hereafter.

May Allah be pleased with him all and grant him the paradise.

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In the name of Allah, the Most Gracious, the Most Merciful

All Praise is due to Allah for His Glorious Ability and Great Power for granting me the health, strength, patience, and ability to survive and complete my doctoral thesis.

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Second, I would like to thank my family for the help that they offered me amid the long PhD travel. A special thanks to my wife Zakiya and my sons Ahmed, Mohamed and my daughters Al Bailsan, Al Joori for their supportive, consolation, and patient comprehension amid my study. Thanks also to my Mum for her daily prayers, supplications and support; and to my dear brothers and sisters for their inspiration and support through the whole four years of my thesis.

Then, I would like to thanks everyone who participated in this study in the two-information gathering of data collection methods interviews and survey.

Last, I would like to thanks every one of my friends who supported me all through my research.

Contents

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Nomenclature

BI	Behavioural Intention
CC	Cloud Computing
CSFs	Critical Success Factors
C-TAM-TPB	Combined Technology Acceptance Model & Theory of Planned Behaviour
DOI	Diffusion of Innovation
DTPB	Decomposed Theory of Planned Behaviour
EC2	Elastic Compute Cloud
EE	Effort Expectancy
EGDI	Electronic Government Development Index
FC	Facilitating Condition
G-2-B	Government-to-Business
G-2-C	Government-to-Citizen
G-2-E	Government-to-Employees
G-2-G	Government-to-Government
G-Cloud	Government Cloud
HCI	Human Capital Index
ICT	Information Communication Technology
IDT	Innovation Diffusion Theory

ITA	Information Technology Authority
MM	Motivation Model
MPCU	Model of Personal Computer Utilisation
OSI	Online Service Index
PE	Performance Expectancy
PV	Price Value
SCT	Social Cognitive Theory
SI	Social Influence
TAM	Technology Acceptance Model
TAM2	Extended Technology Acceptance Model
TII	Telecommunication Infrastructure Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UAEGS	Unified Approach Electronic Government Services
UGN	Unified Government Network
UN	United Nations
UTAUT	Unified Theory Acceptance of Use Technology
VMM	Virtual Machine Monitor

Chapter 1: Introduction

1.1 *Introduction*

This chapter provides a general background to the main problems addressed in this exploration. It begins by the rapid development of ICT during the previous period. Then, defining cloud computing (CC) and the foundation of electronic government (e-government). Then, it covers basic information about Oman, which is the study area for this research, rationale to the study and research scope. After that, it highlights the objectives of this academic study as well as the exploration questions that this study intends to answer and the main existing gaps in current knowledge. Then, covers research methodology and finally, highlights the thesis outline.

1.2 *Background*

Information and communication technologies (ICTs) have led to rapid development in the 21st century, which has transformed society at all levels: individual, community, company and government (Helbing 2010).

ICT focuses on handicrafts or devices used to communicate or transmit information over the Internet, activities and practices in which people participate to communicate or share information. This includes social agreements or regulatory laws that evolved around devices usage and practices (Lievrouw and Livingstone 2006). This has transformed technology

and the performance related to social and practical activities in countries, so that they have been recognised as important factors related to economic development and growth (Margetts 2006; Peña-López 2015). As result, there has been a great rise within the availability of ICTs around the world, including in developing countries (Avgerou and Li 2013). For developing countries, ICTs are important to their development potential (Walsham and Sahay 1999). It has been argued that ICTs can provide tremendous administrative potential to governments and the public sector in general (Heeks 2001; Choudrie et al. 2009). This potential is a natural extension of the technological revolution that accompanied knowledge society, known as e-government (Rugchatjaroen 2015). There is no common definition of e-government, although many agree that e-government is intended to serve the public sector. The author is in the believe of e-government will be defined as the use of information and communication technology to promote and provide public services operations to all institutions of any government (Arvis et al. 2018).

The technology is continued to develop causing changes in public and private sector organisations and society alike one of which, is the cloud computing. Cloud computing is a paradigm that encourages the availability of essential characteristics such as: on-demand service; broad network access; resource pooling; rapid elasticity; multi-tenancy; and scalability, while guaranteeing cost and high performance (Bohn et al. 2011). In addition, cloud computing provides computational flexibility to allow access to electronic services, servers, storage space and much more. In order to use these benefits, governments around the world are turning to cloud service providers to provide

e-government services to citizens, which are costly and cumbersome to maintain themselves. Chan (2009: 16) defined the concept of CLOUD as a standard for computing as: “Common, Location-independent, and Online Utility that is available on Demand". Delivering IT-as-a-Service, it provides ways of accessing massive and diverse data volumes, such as smart city projects using citizen big data or viewing current traffic patterns across the city (Rajkumar et al. 2009). However, these technological innovations come with increased challenges such as network availability, security and reliability, which are some of the biggest concerns of businesses the world over (Kiran et al. 2015).

Following amazing revolutionary tendencies and rapid increases in the use of Information and Communication Technologies ICTs, e-government has grown as a phenomenon over the last twenty years, (Sajjad et al. 2011; Barbosa et al. 2013; Ahmed et al. 2015). Due to the speed of change in this field, there has been considerable growth in the need to undertake modifications (Apostolou et al. 2011; Lallmahomed et al. 2017).

Moon (2010) stated that governments anticipated e-government to be the system that would enhance the quality of public administration and the productivity of public services. Nowadays, the letter ‘e’ is associated with a range of everyday learning, commerce, government, voting and democratic activities (Al-Nuaim 2009).

Many researchers use e-government and digital government interchangeably. However, in this study, the researcher intends to unify e-government services

and their use on government portals by addressing their generic definitions, and to propose a unified approach that can be used across the world. This will not be an argument related to definitions of the government itself, i.e. differenced between e-government, digital government, open government or smart government.

In this study, Oman was selected as a case study because it is one of 193 countries in the Electronic Government Development Index (EGDI) reported by the United Nations (UN). The researcher focused on how to consolidate e-government services in order to prepare to accept a large number of users and develop a framework that can help the Omani government to better implement e-government services. As a result, Oman classification is expected to be improved.

The work in e-government was officially launched in the Sultanate of Oman by decision of the Ministerial Council in July 2012 to unify the work between all ministries and government institutions for e-services and systems in cooperation with the Information Technology Authority (ITA) as the competent authority for information technology. Prior to this decision and plan, each government institution was working individually and separately to plan and implement its new e-services and systems. The e-government transformation plan is the beginning of the expansion of the implementation of e-services in public sector institutions in the Sultanate of Oman. However, a survey conducted by the Information Technology Authority in 2013 found that some organisations had high levels of implementation, some had low

implementation levels, and others had not commenced implementation in that period.

1.3 *Case study context Oman:*

1.3.1. Background of Oman:

The Sultanate of Oman is an Arab country on the south eastern coast of the Arabian Peninsula. It is one of the Gulf countries, along with the Kingdom of Saudi Arabia (KSA), United Arab Emirates (UAE), Qatar, Kuwait, and Bahrain. Oman shares borders with United Arab Emirates to the North West, Saudi Arabia to the West, and Republic of Yemen to the Southwest. The area of Oman is 309,500 square kilometres. It is the second largest country in the Gulf after Saudi Arabia. According to the National Centre for Statistics and Information (NCSI) of Oman (2018), the total population on 16th December 2018 was 4,650,125. The Omani population is made up of 2,614,105 (56.20%) indigenous Omanis and 2,036,020 (43.80%) expatriates' as shown in Figure 1-1.

Figure 1-1 population of Sultanate of Oman

Source: https://www.ncsi.gov.om/Pages/NCSI.aspx

Arabic is the national language of Oman. However, English, Hindi, Balochi and Urdu are also spoken in Oman. Oman is divided into eleven main governorates including the capital city of Muscat.

1.3.2. The Unified Government Network (UGN)

The Unified Government Network is a communications network linking all national government agencies to support the electronic Oman projects and provide the development of public services to citizens and residents. Among the most prominent achievements of the project was the linking of 75 government entities in a unified network in 2015, which is an advance on 73 government entities in 2014, and links 126 new governmental websites compared with 85 new governmental websites in 2014, using NetFlow system to monitor the Government Network Links. The Information Technology Authority (ITA) links the Oman portal with the Cooperation Council for the Arab

Gulf States through Multiprotocol label providing high speed data linking 63 government services in high-speed network of government through shared infrastructure (ITA 2014; ITA 2015).

In 2016, 57 government sites were connected to this network, making a total of 1043 government sites connected since the launch of the network (ITA 2016). In 2017, 54 government sites were connected to this network, making 1060 sites since its launch. The team is working to develop the high-speed network in which 14 government entities are already connected and activated (ITA 2017).

1.3.3. Government Cloud (G-Cloud)

ITA took the initiative in establishing the government cloud project that is a joint infrastructure with Information Technology and was created to serve the requirements and other government agencies to facilitate the achievement of the objectives of e-services. The aim of the government cloud is to establish a common infrastructure that includes services, network, storage and applications so that it fulfils all the requirements and needs of all government agencies from infrastructure to information technology. By means of the government cloud, the governmental institutions can focus on their core business, reduce the IT budget and increase the level of readiness of these institutions and government agencies to provide information and communication technology services at a lower cost. Work appeared in the government cloud in December 2013 and throughout 2014, the initiation team

made a number of important achievements such as the implementation of a complete cloud with self-service portal that was able to automatically meet the needs of customers, and transmitting Oman's digital portal to the government cloud, which completed the first phase of the project. The Ministry of Health project hosted a health portal and completed the inspection, testing of the government cloud security, and training and orientation programs for staff working in ITA. In addition, four software developers were fully trained in open source and the project was awarded an international prize in the category of "best accomplished virtualisation solutions" for a project of cloud computing GITEX 2014. Meanwhile, the team has realised the Governmental cloud during the 2015 implementation of infrastructure services for five government agencies, namely: Information Technology Authority, Ministry of Health, the National Centre for Statistics and Information, Ministry of Information and the Public Authority of Manpower Register. In addition, it has set up self-service access to the government cloud, added Oman Portal projects to the government cloud successfully and implemented the four cloud service platforms, namely; WordPress Portal, email and Oracle DB PaaS. It also established a location for disaster recovery as well as the implementation of more than 29 workshop awareness events about the Government for the various government entities cloud (ITA 2015).

G-Cloud is designed to build a common infrastructure including server, network, warehousing, and applications where all IT infrastructure requirements are met by government entities (ITA 2016). The Government Cloud currently hosts 18 government institutions, which benefit from these

services. Government agencies can take advantage of the government cloud, which could provide the costs of hosting information and technology infrastructure and focus on performance (ITA 2017).

1.3.4. Why the Sultanate of Oman is chosen as the context of this research

In this study, Sultanate of Oman is selected for the following reasons:

1. The Omani government has a strategic plan to upgrade the education of the nation in order to create a distinct Knowledge Society. Subsequently, in 2003, the council of ministers attested a strategy called "e-Oman". This was a framework arrangement to build a Knowledge Society in Oman and change the nation into an information based economy. In addition, it means starting 'government-community-citizen' infrastructure that offers better public services to individuals, achieving basic information development among the legislature and nationals (ITA 2014). Moreover, in 2006, the Royal Decree 52/2006 created a new entity called the Information Technology Authority (ITA). The main reason for the establishment of the ITA was set up to realise advanced government. However, the ITA is in charge of executing national IT infrastructure improvements and overseeing all game plans associated with the implementation of the Digital Oman Strategy (ITA 2014).

2. On the other hand, as indicated by the United Nations report in 2016, Oman has reached 66th place on E-government Development Index (EGDI)

ranking. However, in TII was 0.5147, OSI was 0.5942, HCI was 0.6796 and EGDI was 0.5962 (UN 2016). In 2018, TII was improved to 0.5399, OSI was 0.8125, HCI was 0.7013 and EGDI was 0.6846 (UN 2018) see Table 1-1. The improved TII, OSI, HCI and EGDI has led to the improved ranking i.e. improved e-government services.

3. Moreover, Oman has aroused public interest in ICT. A prize action started from 2010 to encourage public and private sector organisations to work towards fulfilling the key course of action and move toward embracing and actualising electronic government, Information, and Communication Technology (ICT) in both private and public divisions. This prize was called 'Sultan Qaboos Award for Excellence in e-government' about award (ITA 2014). It is believed that this approach led to an improved citizen engagement.

Table 1-1 Oman ranking in e-government development index (EGDI) from 2001 to 2018

Year	Ranking	EGDI	OSI	TII	HCI
2001	56	1.64	2	0.250	0.747
2003	98	0.355	0.262	0.132	0.670
2004	127	0.288	0.050	0.135	0.680
2005	112	0.3405	0.1731	0.1385	0.7100

2008	84	0.4691	0.4849	0.1559	0.7659
2010	82	0.4576	0.1252	0.0690	0.2633
2012	64	0.5944	0.6667	0.3942	0.7224
2014	48	0.6273	0.7323	0.4873	0.6624
2016	66	0.5962	0.5942	0.5147	0.6796
2018	63	0.6846	0.8125	0.5399	0.7013

This study will present a recommendation that has not previously been made in the literature and which will explore the relationship among unified prototype framework of government portal services. Additionally, despite the limitations of the Omani context it is expected that the findings of this study may be broadly generalisable to other developing countries that are moving to implement e-government. It is hoped that this study will be as able to be used as a basis for future research in this field.

1.4 *Research aims and objectives*

After realising that there is a need for more research in the field of e-government services when noticing the presence of some services that are

not fully utilised. This study is aimed to reduce this gap using the context of a country that the researcher is familiar with - Oman. Statistics have shown that Oman is still in the low level side of the UN e-government ranking and that government institutions are trying to raise the rank of services and activities by supporting the participation of citizens to use electronic services via the Internet.

To achieve the objective of this study, a comprehensive literature review of e-government research, cloud computing and acceptance of the use of e-government services in developed, developing countries and the GCC countries was conducted. This has also included relevant theories on ICT diffusion and adoption, institutional and culture theories.

The research will then aim to find out an actionable framework that can help better utilising available services and beyond. This will have to address government and citizen fronts alike. While investigating the above a unified approach of e-government services is proposed. It is believed that it could form a trial phase for developing countries. The first study is designed to be an exploratory interviews with several government top management officials aimed to understand their perspectives of e-government services , and their views of improving them while include the middle level and the operational level management. The second study is then conducted to address the citizen perspective and managed to get over 400 qualified responses.

1.5 *Rationale for the study*

Continued developments in information technology require more public institutions to develop e-government efforts. E-government provides citizens with easy access to information and services (Schaupp and Carter 2010), the ability to search for important topics without any geographical restrictions (Schaupp and Carter 2010). A number of studies (Coursey and Norris 2008; Chan 2009; Heeks and Santos 2009; Dwivedi et al. 2017) indicate a lack of theoretical development and rigor in e-government research, whereas this study takes a step toward and evaluates the impact and acceptance of unified approach model for e-government services specifically in Oman and in general in developing countries.

Thus, there is a need for a study examining the acceptance of users to use e-government services, and more specifically, there is a need to study using e-government in the context of developing countries. Accordingly, this study aims to address the acceptance of the use of e-government services by focusing on one of these countries, Oman. The study explores the role of a unified approach of e-government services in the Omani public sector institutions in the implementation of the government and increasing the acceptance of users of e-government services.

In this study, Oman was chosen as a case study because of the consistent decline in the ranking of the UN report on e-government. Official work on the "e-Government Transformation Plan" was launched in July 2012. Prior to this plan, each organisation had worked separately to plan and implement its new

systems without any centralisation or follow-up by the competent state authority concerned with the state, the Information Technology Authority. The e-government Transition Plan represents the beginning of the journey to expand the application of e-government in public sector institutions in Oman. However, according to semi-annual UN reports from 2001 to 2018 to assess e-government, Oman remains low. Therefore, one of the reasons behind this research was to explore and understand why Oman has only achieved these low ranks and try to increase the classification of high ranks as in advanced countries such as the United Kingdom and the United States of America as well as developing countries such as Estonia and the Kingdom of Bahrain. In addition, it was important to assess the impact of e-government consolidation on the cloud in terms of the impact of user acceptance of e-government services (Kumar Sharma et al. 2013) as currently each institution operates alone without reference to the United Nations international standards for the classification of e-government. The study is based on the current approach to the consolidation of electronic services in various public sector institutions to assess the acceptance of users of these services. The UTAUT2 model was used to identify and evaluate the behavioural intention to use e-government services included in this study to improve and develop e-government services in Oman.

A review of current user acceptance models contains several research studies of the information system over a long time as well as how individuals adopt new information technologies. In the investigation of this broad field, there were a number of courses of study (Venkatesh et al. 2003).

One research group also focuses on individual acceptance of technology using intention or use as a dependent variable (Davis et al. 1989; Compeau and Higgins 1995) while each of these studies makes a significant contribution to the literature on user acceptance of information technology, the theoretical models to be included in the current review use the intention of behaviour / use as a major variable (Venkatesh et al. 2003).

1.6 *Research Scope*

This study examines the use of e-government services in public sector organisations in Oman and will not cover technical aspects.

Therefore, an interviews process with 21 participations from three different management levels in 17 governmental bodies were designed and implemented. This has included Royal Oman Police, Ministry of Education, Ministry of Manpower, Ministry of Finance, Ministry of Tourism, Ministry of Higher Education, Institution of Public Administration, Ministry of Health, Ministry of Housing, Information Technology Authority, Ministry of Civil Services, Ministry of Environment, Ministry of Justice, Ministry of Commerce and Industry, Ministry of Inertial, Ministry of Heritage & Culture, Ministry of Endowment and Religious Affairs. Upon studying wide range of academic literatures, the research has led to propose another approach of e-government services, the unified e-services portals. Therefore, this study will focus on public sector organisations in a developing country. This shows that a

questionnaire should be conducted to better understand the citizen perspective.

1.7 *Research Questions*

Based on the above, this study is to investigate the impact of unified approach e-services implemented over the cloud aiming to improve the utilisation of electronic government services in Oman. Therefore, the research attempts to address and answer the following questions:

1. Can criterias used by the United Nations classification of e-government services also be used to improve their utilisation?

2. How can a proposed unified approach affect the acceptance of e-government services by both; government and citizen users?

3. Can the proposed unified approach support the government to spread its e-services to citizens?

1.8 *Research Methodology*

Having offered a research scope, this section now provides some brief insights into the applied research method. Providing a rich and deep understanding of e-government is the focus of this research. Many scholars have suggested the use of a mixed method research approach to achieve more accurate and reliable data, it is necessary to use more than one method instead of using only one method, because each method provides information and the data will

have breadth and depth (Thomas 2017) and to allow greater confidence in results (Creswell and Clark 2017).

The main context of this method is to explore the impact of unified approach of e-services on government cloud (G-Cloud) in public sector institutions. Moreover, by the use of more than one method, the research aims to expand the credibility and reliability of its findings.

Therefore, upon in depth and wide literature study, interviews with 21 participations from three different management levels in 17 governmental bodies were conducted. Then, this was followed by questionnaire that has attracted over 400 qualified citizens' responses. The research process has led to another approach of e-government services, the unified e-services portals, based on previous academic literature studies. This research seeks to explore and understand the user acceptance of using e-government services over the cloud. In this research methodological triangulation is used as supported by scholars who recommend this approach involving the use of more than one data collection method, to achieve a stronger substantiation and improve research credibility (Creswell, 2003a; Huberman & Miles, 2002; Stake, 2010). Furthermore, and because of cultural factors in Oman in which face-to-face conversation is vital, the researcher used in-depth interviews to seek a richer and deeper understanding.

1.9 *Thesis outline*

The study will be divided into two stages. The first stage looks at the macro level. It studies the impact of unified approach e-services on the government cloud. This stage is an initial study and covers different countries around the world as well as Arab countries. The second stage will look at the micro level. It will study the impact of unified approach e-services on acceptance of using the Oman portal. This stage will be in-depth and more detailed than the previous stage and will cover some public sector organisations in Oman. Stage 2 will use a qualitative method (interviews) to collect primary data. This study is planned to be divided into eight chapters.

1.9.1. Chapter 1 – Introduction

This chapter introduces the thesis contents, layout and phases. It also provides a background to the study and topic with aims and objectives. Then, it shows Oman ranking in e-government development index (EGDI). Furthermore, it highlights the rationale to the study then illustrate research gaps and research questions. It provides an introduction of Oman and why Oman is chosen as context of this research.

1.9.2. Chapter 2 – Literature Review

This chapter provides comprehensive details about the cloud computing and topic of e-government services in the literature worldwide. The experience of the developed and developing countries in the context of usage of e-

government services. In addition, it provides examples of government cloud countries and definition of e-government Critical Success Factors (CSFs) that have been collected and introduced in this research.

1.9.3. Chapter 3 – Research Methodology

This chapter introduces the research methodologies in general and research approach that followed by the researcher in this study. In addition, this chapter will discuss and present data analysis techniques.

1.9.4. Chapter 4 – The Government Perspective; Initial Study

This chapter includes study of twenty developed and developing countries, which had top rank in united nation index reports from 2001 until 2018. The researches illustrated on six e-government portals to explored to differences between these portals.

1.9.5. Chapter 5 – The Impact of Unified Approach of e-Services; Analysis and Findings

This chapter provides a detailed study analysis for the qualitative study with government top management, middle management and operational level management to explore the impact of unified approach of e-services and current status of e-government in sultanate of Oman and why Oman not reach the top ranking report in previous years.

1.9.6. Chapter 6 – Technological Acceptance Model Approach

This chapter provides the reader with the formulated research model that was designed based on the output of chapter three. It introduces the survey questions, the hypothesis and the constructs involved in the model. The comprehensive analysis is reported and the hypothesis is tested using chi-square test.

1.9.7. Chapter 7 – A proposed Framework

This chapter comprises a detailed discussion highlighting the findings of the research. The model components are introduced and thoroughly discussed. The framework of implementing e-government services.

1.9.8. Chapter 8 – Conclusions and Further works

Finally, this chapter concludes the thesis and shows the limitations of the study, the contribution to the body of knowledge, and future work are presented at the end of this chapter.

1.10 *Research process*

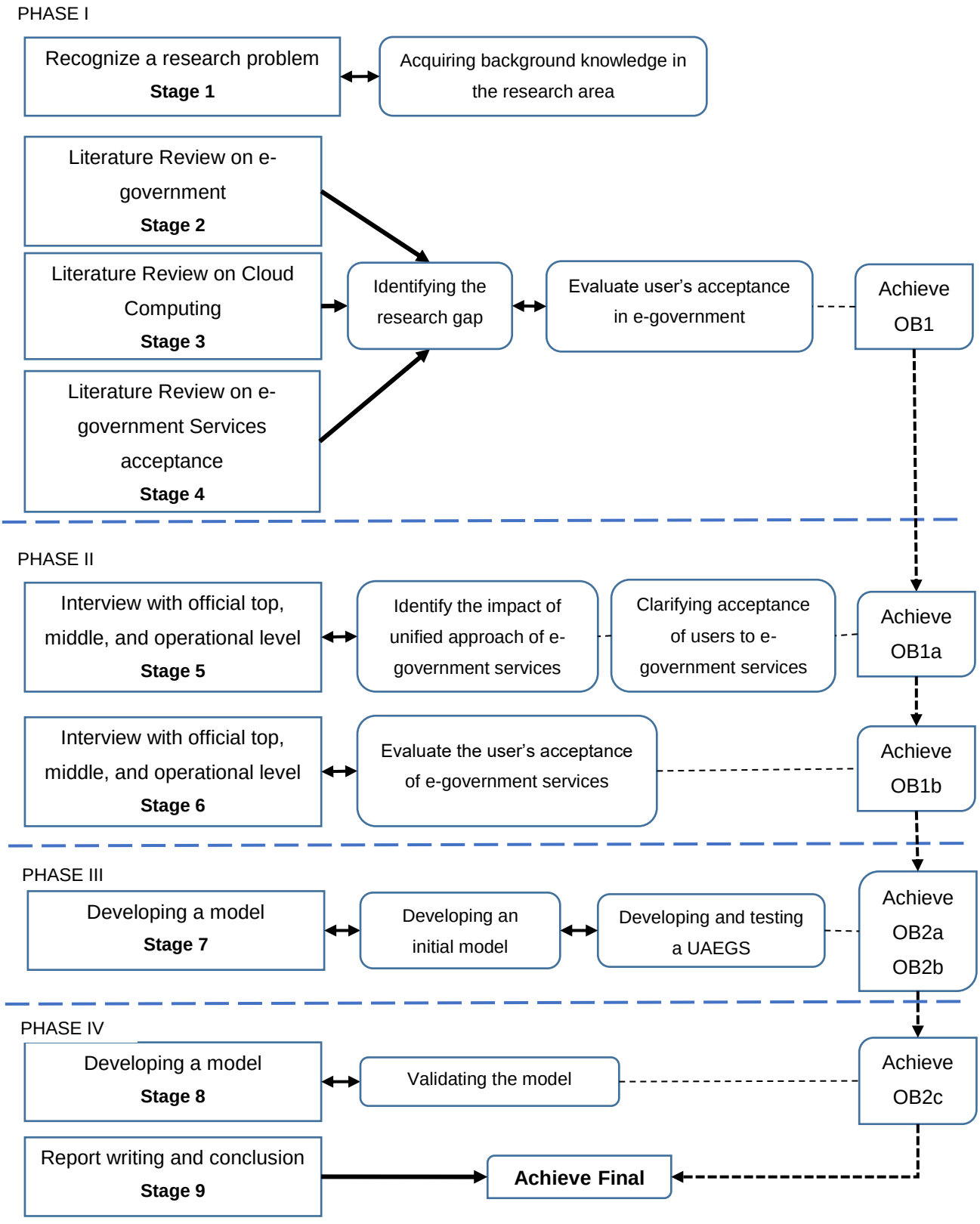

Figure 1-2 Research Process

1.11 *Appendices*

Appendix A: Semi-structured Interviewed Consent Form and Questions

Appendix B: Questionnaire

Appendix C: Initial study – Merge main and sub-components of e-government services of six countries portals.

Appendix D: SPSS Frequency Tables

Appendix E: The List of Public Sector Institutions in Oman.

Appendix F: Chi-square table

Following diagram shows, the structure of the thesis chapters that will followed to achieve the goals of this study.

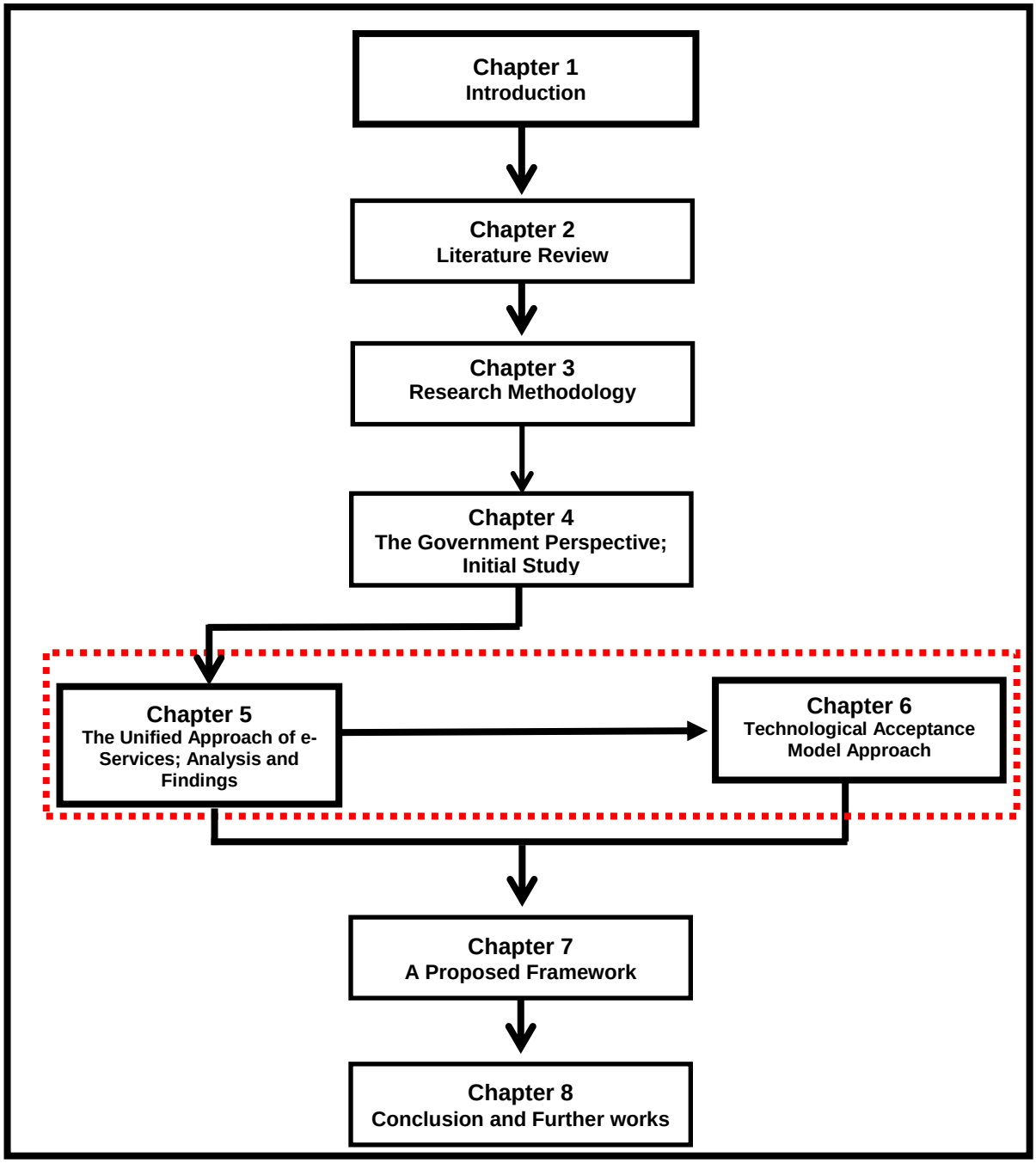

Figure 1-3 the structure of thesis chapters

Chapter 2: Literature Review

2.1 *Introduction*

The purpose of the literature review is to identify challenges and gaps comprehensively and to create a framework that is intended to be a sample or trial product for Oman, and any country, which do not have full intended functionality and wish to implement e-government services on their official websites and to increase the acceptance of users through this trial framework of e-government services. E-government services are emerging as a framework based on the theoretical background. In order to present the unified approach and how it could influence technology, it is useful to comment on cloud-computing, models of cloud computing, electronic government portals and their relationship to each other. Furthermore, several definitions of the concept of cloud computing, in addition to the definition of e-government, are given. Finally, this chapter focuses on the importance of adopting and implementing e-government services on portals to increase the level of trust, security, usability, web design, content, and quality of information received by users of all government institutions.

2.2 *The Public sector in Oman*

Since Oman is the context of this research study, a brief description of the public sector in Oman is provided. The public sectors in Oman and the GCC may be similar because of the organisational spirit that lies in their common

culture. This uniqueness is linked to the similarity of religious traditions, values and society that characterise the Bedouin and their tribal way of life.

The Omani public sector is an environment of people, culture and agencies collaborating under the rule of the authority for the purpose of serving the public (Alshehri et al. 2013). The Council of Ministers assists the Sultan in formulating the country's general policy and makes recommendations on economic and administrative matters of concern to the government. The Council is also responsible for overseeing the operations of the administrative apparatus in the country and how ministries function and perform (Oman, 2014). Ministries are composed of other government entities (Regional Public Administration, Public Establishment and Public Institutes), each headed by a Minister (Mohammed 2005).

The public sector has 11 governorates (areas): Muscat (the capital city), Dhofar, Musandam, Buraimi, Dakhiliyah, North Al-Batinah, South Al-Batinah, North Sharqiyah, South Sharqiyah, Al-Dhahirah and Al-Wusta.

Each of these provinces has its own management, geographical and economic responsibilities, and the Sultan appoints each province. In addition, each governorate has a total of 61 states.

The governors of these states are overseen by the waly (local governor), who reports to the governor. The governor reports to the Ministry of Interior except Muscat and Dhofar in south of Oman, which report to the Council of Ministers. The waly is responsible for the local administration of the state and is

considered the link between local issues for citizens and other government institutions (Oman, 2014). The public sector in Oman comprises 80 government bodies. In general, some government service institutions try to serve citizens by publishing services on websites (Oman, 2014).

2.3 *E-government academic literature review*

2.3.1. What is e-government?

There is no specific definition of e-government because it is difficult to define a term from a single perspective where the term has different meanings from different perspectives (Heeks and Santos 2009). According to the literature, e-government has been defined in several contexts. The World Bank has defined e-government as the use of information and communication technology to promote and provide public services and business operations to all institutions and agencies of any government (Arvis et al. 2018). Almarabeh (2016) posited that e-government is defined not only as web portals or network systems, but it is as a platform for transparency between government and citizens on citizen participation (Publishing and Organisation for Economic Co-operation 2010). The United Nation in an e-government development index survey defined e-gvernment as “the use and application of information technology in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and

empowerment of people" (UN 2014, 2). In this study, the definition of e-government used is what was defied in the introduction of chapter 1.

E-government provides an excellent opportunity in the twenty-first century to consolidate relations between governments and citizens and to provide the population with high quality and effective services in line with adequate financial resources for governments (Heeks 2005a). These e-services can be used to reach all citizens and users with the provision of multiple public services under effective and attractive management (Heeks 2005a; Shareef et al. 2010). Furthermore, e-government makes the citizen's contribution to government more valuable, effective and more efficient (Holzer and Kim 2005).

E-government is a model of ICT governance that is used to provide services to citizens and other stakeholders in a convenient way (Heeks 2005b). As governance changes continue and governments become more accessible, citizens need to participate more efficiently in the whole process. This requires a high level of accountability and transparency among government agencies and institutions (Heeks 2005b).

2.3.2. E-Government classification

E-Government scholars categorise the relation between the governments and their participants from the perspectives of Information Technology in the following models (Christensen and Lægreid, 2007; Gyaase and Kwadwo., 2014):

2.3.2.1. Government-to-Citizen Model (G-2-C)

The G-2-C model refers to the type of electronic government that focuses on citizens' requirements and needs. This type of scheme offers the unlimited online availability of government information freely and on request, providing all the e-services which meet public requirements. Additionally, the service is interactive and allows citizens to fully participate in government affairs (Gyaase 2014). This is achieved through online government systems including hyperlinking portals to facilitate the different public services available (Ebrahim and Irani 2005). The G-2-C model facilitates co-operation between government agencies and citizens, different democratic parties and other agencies to widen participation in different political aspects, such as e-voting (Edmiston 2003). Although many attempts have been made by developing countries to replicate similar digital government models, there is as yet insufficient empirical research into e-government in this context (Gyaase 2014).

2.3.2.2. Government-to-Business Model (G-2-B)

This represents the communications and interactions between governments and all related private and public businesses bodies in a way that utilises the technology in all relevant aspects (Finger and Pécoud, 2003). G-2-B proved its ability to control all government activities by promoting the principles of transparency and accountability among government institutions and agencies (Moon 2010). Portals have been developed by governments to improve this interaction, management of documents, shopping, delivery services, cost and

time reduction, and increasing transparency in public decision-making (Heeks and Mathisen 2012). This entails the development of portals for such services as e-procurement on a site which is easily accessible by all citizens and for the monitoring of all types of feedback (Charoensukmongkol and Moqbel 2014).

2.3.2.3. Government-to-Government Model (G-2-G)

This model explains the service provision and interaction of the government agencies with each other, utilising the innovative technical media to the maximum. This method of relationship prevents government institutions from being in a situation of wasting effort and resources (Christensen and Lægreid, 2007). The Implementation of Digital Government provides the government departments with the possibility of making their resources accessible to the public, to create an effective environment within which decision-makers can work in a way that is not possible by more conventional means (Christensen and Lægreid, 2007). This model also offers a facility for participants and national and local government authorities to work together to share their practices.

2.3.2.4. Government-to-Employee Model (G-2-E)

Governments worldwide usually hire a large number of people to implement their strategies to achieve their aims and objectives. The G-2-E model describes the technical part of this interaction between the government and its members of staff to guarantee that government supervision is efficient enough

to monitor their employees' day-to-day activities and requirements. The coordination effectiveness and efficiency are monitored by internal and external government agencies to ensure the quality of the services delivered (AlAwadhi and Morris 2009).

Gyaase (2014) claimed that although these classifications afford an opportunity to understand the possible relations which might exist between the governments and all other participants, its success, nevertheless depends on how mature the digital government is in that specific country (Gyaase 2014). Because the issue of digital government is still in the early stages of development, especially in developing countries, authors have drawn attention to the lack of empirical studies especially in the context of the Digital Government Models discussed earlier (Gyaase 2014).

2.4 *Cloud Computing*

The term cloud computing refers to the sources of Information and Communication Technology (ICT) services available on demand through the Internet. In recent years, there has been much interest in issues related to cloud computing and Software as a Service (SaaS) services on the IT landscape. Individuals have claimed that cloud applications and the SaaS world is a more interconnected world where they can access data and information at any time and from almost anywhere, which means that SaaS has many advantages for the public sector in terms of the ability to use the services in easy and simple ways through the government portal.

2.4.1. Service Models

Cloud computing offers a range of services from software to infrastructure, which can be exploited as needed by the users and developers,

- **Software as a Service (SaaS):** provides software as a service through applications accessible via the web, such as a web-based email.
- **Platform as a Service (PaaS):** offers the platform for developers as a service in order to develop applications, such as programming languages and tools.
- **Infrastructure as a Service (IaaS):** offers infrastructure such as operating systems or storage servers as services, where consumers can deploy and run their software such as Amazon EC2 Cloud services.

2.4.2. Deploying Models

In addition to industries providing cloud platforms, some governments have chosen to build their own infrastructures to provide private cloud services. There are three such deployment models for cloud infrastructure,

- **Public Clouds:** Here all resources are based at an external service provider similar to using Azure, or Amazon EC2. The service provider is responsible for management and administration of services. In this case, the client (or government) is only responsible for any software or client application that is installed on the system. Connections to public clouds are made through the Internet.

- **Private Clouds:** Private deployment models are the resources located internally to the organisations using them. The organisation is liable for any software or client application installed. These services are accessed through a local area network (LAN) or a wide area network (WAN). Remote users provide access through the internet, or many times through virtual private networks (VPN) and all data is held internally.

- **Hybrid Clouds:** This is a mixture of the above deployment models to provide more flexibility for organisations' requirements.

Each deployment model offers its own security and delivery challenges, where private clouds are the most secure and maintained by the organisation themselves. In using public clouds, the location of data centres and their security protocols need to be considered when porting data and services to them.

2.4.3. Examples of Cloud Computing components

Cloud computing comprises two main components: the front end and the back end, which are connected by the Internet. The front end refers to the medium through which the user accesses the system and it comprises the various applications through which users access the clouds and a computer network. The back end refers to the cloud itself and provides the computers' data storage, which develops the cloud's services, servers and applications.

The cloud has a virtual machine monitor (VMM) that allows simultaneous access to the cloud's applications. These layers are the infrastructure layer, platform layer and the application layer. The infrastructure layer is the base of the cloud that comprises of the network devices, the storage facilities and the servers. The platform layer provides the application infrastructure through (PaaS), a user can access the operating systems and other services. The application layer is mostly seen as the cloud. All the applications go through the application layer that is provided on demand to the users.

2.4.4. Advantages and Disadvantages of using Cloud Computing

There are advantages of using cloud computing in governments that significantly reduce the high cost of implementing e-governance when compared to the cost of traditional IT services. Another benefit is increased flexibility; on-demand computing across technologies, business solutions and large ecosystems of providers. However, the service quality and software always update automatically in cloud computing. Therefore, the users can access from anywhere and the services can be accessed from a single computer or network. Finally, there is the advantage of elastic scalability and pay-as-you-go (Rastogi 2010). According to Wyld (2009), the most important benefits of using cloud computing are the improvements in utilisation elasticity, reduction in maintenance and upgrades, improved economies of scale and collaboration capabilities, on demand Information Technology infrastructure, green environment and improved disaster recovery (Wyld 2009). Table 2-1 shows how to calculate the cost of depreciation, cost of power consumption,

cost of maintenance, cost of setup and configuration, cost of space and the total cost of ownership of infrastructure.

Table 2-1 An equation of cost modelling system for cloud computing

How to calculate total cost of the ownership of infrastructure

Cost of power (Cp)
Cost of space (Cs)
Cost of maintenance (Cm)
Cost of depreciation (Cd)
Cost of setup and configuration (Csc)
Salvage Value (SV)
Economic Life (EL)
Total Cost of Ownership of infrastructure (TCO)

Example:
30 PC -- Each PC cost (Cpc) £600
5 years (No Salvage Value)
Power consumption 180 w/h – (0.18 kwh)
Maintenance £ 100 per month (£ 1200 per year)
Setup and configuration £ 120 per system
Power utility charge £ 0.15 per kwh
Power Utilization Efficiency (PUE) is 1.7

Cost of depreciation (Cd)
= (Cpc – SV) / EL
= (600 – 0) / 5 = **£ 120** per system

Cost of power consumption (Cp)
Cost of power/h = 0.18 x 0.15 x 1.7 = **£ 0.05**
Total number of hours per year = 8 x 5 x 30 = **1200 hours**
Annual cost of power per system = 0.05 x 1200 = **£ 55.08**

Cost of maintenance (Cm)
= 100 x 12 months = **£ 1200**

Cost of setup and configuration (Csc) = **£ 120**

Cost of space
Average space required per system is 23 m^2 which cost about £ 4 per m^2
Annual cost of space (Cs) for 1 system = 4 x 12 months x 23 = **£ 1104**

Total Cost of Ownership of infrastructure (TCO)

TCO = (Cpc + Cp + Cm + Csc + Cd + Cs) x (N)
= (600 + 55.08 + 1200 + 120 + 1104) x 30
= £ 95,972.40 per year
TCO per hour = £ 95,972.40 / 1200
= **£ 79.97**

TCO per hour for each system = £ 79.97 / 30
= **£2.67**

Ref: A cost Modelling system for cloud computing, 2014

Nevertheless, projects designed to implement e-governance face many challenges and are not always successful. Just 15% of the total number of e-governance projects undertaken ended in success, whereas 50% were partial failures, and 35% were total failures which had to be completely abandoned (Chander and Kush 2012). However, Nycz and Polkowski (2015) said that the most important criteria that determined the transition to the Cloud Computing model were as follows: economic factors, ease of deployment, flexibility in increasing and decreasing resources. The main disadvantages of CC concern the lack of physical user control of their data. Also important is the problem of ensuring the continuity of access, as well as security in the event of a server failure. Another issue is how to connect to a computer centre via the Internet, which, depending on the Internet service provider, does not always work properly. According to Wyld (2009) the most important issues facing the use of cloud computing were the need for high reliability, security of cloud data, open interoperability and standards, procurement revision processes, the resolution of legal issues, cloud market regulation, role redefinition for IT workers, the return on investment in cloud computing and government cloud coordination (Wyld 2009).

2.4.5. E-government in Oman and prior research on Oman's E-government Initiatives

Following the background of e-government, this section describes the e-government services program in Oman, which is the focus of this study.

Recognising the importance of ICT in transforming traditional government into digital government, Oman launched its first e-government initiative in 2003.

E-Oman was an e-initiative supported by, an organisation established by the government in 2003. The first task was to set specific government-backed standards for all organisations and to create a common platform that established the basis for government cooperation in the full integration of all government systems. In addition, e-Oman identified ICT needs for all government agencies. However, these processes took a very long time to complete. This organisation is called the Information Technology Authority (ITA) and is responsible for the development of government portals and the necessary infrastructure required (Abanumy et al. 2005; Al-Busaidy and Weerakkody 2011).

Today ITA is responsible for the development and implementation of Oman's electronic strategy and e-government in Oman. This vision aims to transform the Sultanate of Oman into a knowledge-based society with innovative technology, in order to improve government services and empower the public with technical knowledge (Adeoye 2014).

A United Nations e-government survey showed that Oman continues to expand e-government services, including the expansion of infrastructure and the development of online e-government services. As a result, the global rankings of e-government in Oman is still needs to encourage and enhance the e-government services to accomplish its investment in developing national portals aimed at providing Omani citizens with innovative electronic services.

2.4.5.1. Previous studies of e-government initiatives in Oman

Several studies have examined e-government services in Oman, suggesting that, despite the ITA initiative, ITA should develop some simple e-services that citizens can easily understand and use (Al-Busaidy & Weeraklody, 2011). Previous research has found that many government institutions in Oman operate under the ITA initiative and implement e-government with the ultimate goal of transforming government into a sustainable knowledge society. He proposed strengthening services and empowering citizens with knowledge (Espinosa and Al-Maimani 2010). This research also found that Oman has a long-term digital development strategy known as 'Oman 2020', which includes maintaining and improving ICTs as well as increasing research and enhancing technical knowledge. To define readers, Oman e-government strategy (e-Oman). These projects include e-Awareness, Innovation and Support Centre, International Relations (INTRL), National Centre for Disaster Recovery, e-Law (e-Law), National e-Payment Portal, Information Security Management Framework, Converged Government Network, and Government e-Services (e-Services) National Training and Awareness of Information Technology and Standard Framework (STDF).

In 2008, the Information Technology Authority (ITA) modernised e-Oman with a focus on three key areas: IT industry development, community empowerment, individuals and e-government services. These changes were due to the Omani Sultan's speech to the Council of Oman, which requested government assistance in implementing a simplified e-government process,

adopting the latest technologies for daily government operations and focusing on providing the government with more electronic services to the public (ITA 2015).

When evaluating e-government services strategies in Oman, academic researchers identified a weakness in new implementation strategies: ITA did not consider public opinion and government employees, resulting in delays in the initial stages of implementation of the strategy (Al-Mamari et al. 2015). However, despite the ITA initiative to implement the e-government strategy, it has no authority to impose it on other government institutions. They can only coordinate their efforts with those institutions to implement such things. This lack of authority led to a gap between these institutions in adopting e-government services standards in the initial stages, causing a long delay in the initial implementation of ITA (Al-Mamari et al. 2015).

2.4.5.2. Challenge the application of e-government in the Sultanate of Oman

The implementation of e-government services in Oman faces many challenges. Previously, insufficient support from senior management, difficulties in integrating and sharing information between government institutions and the capabilities of e-government implementers were identified as the main challenges. In recent years, issues related to outsourcing, external consultancy and infrastructure have been identified as the main obstacles (Al-Busaidy & Weeraklody, 2011).

A different study of the Omani government and e-government showed that many stakeholders (government and citizens) from the public sector were very optimistic, and the implementation of e-government services is expected to be a smooth and rapid transition and will take place within a year or two (Espinosa & Al-Maimani 2009). However, the study confirmed that these individuals lack the basic knowledge and concepts of e-government services implementation, and that such implementation requires a consistent foundation such as technology.

2.5 *Government Cloud (G-Cloud)*

2.5.1. Moving government to clouds

Cloud resources can bought or rented, with current Amazon services priced for small data resources (i2.xlarge) at $0.853/hour and large data resources (d2.8xlarge) at $5.520/hour, for on-demand resources. Additional instances can be reserved on 1 to 3 year terms, but may prove expensive in the long run, especially if data needs are not as intensive at all times. Forrester research, working with technology and business leaders, has forecast a growth of $75 billion for small and medium sized businesses using Cloud services for their data management applications. SAP industries argued that the advantages of lower costs, fewer installation needs, ease of management and fewer IT resources were needed as the most attractive business model for this surge in demand. However, this technological innovation is hindered in its global usage by increased challenges such as network availability, security,

and reliability as the biggest concerns of worldwide businesses (Memon et al. 2014).

The researcher conducted a thorough literature review and to date, could not discover any papers or studies that have inspected an authoritative unified approach of e-services on a government cloud. Thus, this is an area deserving of further studies as there seems to be a gap in the literature. It found that a great part of the current research tends to concentrate on the selection of utilising innovation or implementing new technology from a client's perspective and this study likewise focuses for the most part on an SaaS Model (Software as a Service), which concentrates on perspectives, for example, acknowledgment of utilization, convenience and helpfulness to the clients. Therefore, most studies examined the clients' perspectives and overlooked the organisation side of either private or public sector. From the literature review of this study, there are no obvious studies that cover the unified approach services on government cloud framework which affect the usage of electronic government. This is a critical area that merits greater research. This study will introduce an underlying conceptual model that highlights the issues identified with unified approach services and government clouds. Therefore, the reason for this review is to investigate this region to fill the gap by making a contribution to knowledge in this area.

2.5.2. eDepot

Sweden, Italy and Belgium used electronic public services called eDepot project, to offer a quick and easy way to create a company in all administrative databases. With eDepot, companies sign deeds deposited electronically using a ‘REAL card’ system to serve as eID card. This is used to identify company activities, instead of taking 56 days to complete; it takes no more than 3 days (Wauters et al. 2011).

2.5.3. Examples of G-Cloud countries

2.5.3.1. European

The European Commission's research demonstrates that the Cloud Computing business is worth approximately €80 billion in Europe alone, and its improvement is contributing to and expanding European GDP, which is expected to reach €160 billion by 2020. Through by the use of clouds, 2.5 million new jobs can be created in Europe, and 80% of associations are starting to utilise cloud computing, accomplishing cost savings of at least 10-20%, which may be important particularly in times of economic crisis. Until now, the main impediment to the advancement of Cloud Computing in Europe is the different regulations of the 27 different member states on matters such as data protection. The European Commission needs to create one general regulation for all member states.

The European program "Horizon 2020," which came into force in 2014 provides approximately €2 billion to create new Cloud based services (Nycz and Polkowski 2015).

2.5.3.2. United Kingdom (UK)

The United Kingdom (UK) government constructed “G- Cloud,” as a government cloud-computing system. The Digital Britain Report, issued in June 2009 by the Department for Business Innovation and Skills and the Department for Culture, Media and Sport, calls for the UK government to take the lead in a wide-ranging digital strategy for the country. An important aspect of the Digital Britain strategy is to improve IT use in government and allow for more services to migrate online. To support this action, the UK’s IT procurement efforts will be focused on enabling the government to become a leading force in the use of cloud computing. The government can use its position as the leading procurer of services, to drive up standards and to provide an investment framework for research and development (Hashemi et al. 2013). In May 2013, the UK government developed the ‘cloud first’ technique as part of their G-Cloud initiative, which required that companies who use cloud-based services must make this primary alternative recognized by the general population when purchasing the majority of IT data and service (IT) results and services. The main objectives of the G-Cloud and corresponding ‘cloud first’ strategies are to: build the adoption of cloud technologies across the public service; create a greater amount of alarmed structures which encourage improvements in conveyance and help

government technological policies and strategies; improve practicality and ecological focuses (Clohessy et al. 2014).

2.5.3.3. United State of America (USA)

The official website of the United States government is www.usa.gov and is intended to allow residents to cooperate with government departments. It is remarkable amongst the busiest website portals, receiving almost 342,000 visits daily. However, clients initially endured long time delays and downtimes during peak times such as voting seasons and monthly unemployment statistics. The US government concluded that it needed to create new IT devices to utilise more power and extra security but the time spent overhauling this site might have been nine months with costs amounting to two million dollars for product licence software and a further $350,000 annually for overhauling staff costs such as hardware. Vivek Kundra recommended migrating to the cloud to reduce expenses by up to 90%, and move forward capabilities, framework adaptability and finishing methodology mechanisation. Cloud-based results made on upgrades of the site take only a single day, compared to nine months in the previous system. Thus, the accessibility of the website was expanded by up to 99.99 % for very almost zero downtime every month. Costs of migrating to www.usa.gov have diminished to just $650,000 annually (Yeh et al. 2010; Hashemi et al. 2013).

2.5.3.4. South Korea

In 2014, the government of South Korea made a decision to migrate to the cloud with the intention of becoming the “strongest cloud computing country in the world by 2014”. The integration involved 40 government departments migrating to the cloud with the intention of laying a foundation for rejuvenating the private sector market in South Korea. For cloud usage, the South Korean government required durable laws and policies across each of the general population sectors, as well as the promotion of enterprise, development of innovative organisation, special care, and public relations at the government level, and therefore a precondition was a comprehensive governance framework (Song et al. 2013). Furthermore, the South Korean government collaborated on a cloud-computing task entitled “Next Generation advanced administration in a Cloud Computing Environment" to produce the N-Screen Service, which “enables information imparting once various platforms to portable phones, tablet computers, televisions, and personal computers” (Clohessy et al. 2014).

2.5.3.5. Ireland

In November 2011, the Government of Ireland launched public service reform plans that contained obligations to cloud computing and shared services. In February 2012, the Irish government revealed its initial cloud computing activity Cloud4Gov. The Cloud4Gov programme, a synergetic organisation between IDA Ireland and the EMC Corporation, includes the development of a cloud centre with hubs in government networks (Clohessy et al. 2014).

2.5.3.6. Japan

Kasumigaseki cloud is a major cloud computing which accommodates Japan's national government. It is a private cloud environment that could possibly host the all of Japanese government's computing eventually. As stated by Japan's service in Ministry of Internal Affairs and Communications (MIC), the Kasumigaseki cloud will gather greater information and resource sharing and promote more standardization and consolidation in the IT resources of government, with the aim not only of reducing costs and operational benefits, but also offering more environmentally friendly IT operations. The Kasumigaseki cloud is part of an advanced Japan formation project (100 trillion yen) to help the economy by creating several hundred thousand new IT jobs in the next few years and doubling the size of Japan's IT market by 2020. The MIC states that "accelerating the utilization about ICT across the nation will oblige the government to take the initiative in implementing measures," and that the national government's advancements around cloud computing will not only help spur ICT development, but also will assist in filling gaps in technology in Japan (Hashemi et al. 2013; Clohessy et al. 2014).

2.5.3.7. China

In March 2008, Wuxi cloud computing centre provided local software outsourcing industry with cloud computing services support in order to accelerate the development of the software industry. Hong Kong government's optimistic view of cloud computing was that "collaboration and communication – internally, between departments and citizens – hold maximum potential with

a shift to cloud technologies." In September 2009, the Cloud Computing Centre had provided enterprise with information technology support via cloud computing (Yeh et al. 2010).

2.5.3.8. Indonesia

The Indonesian Government spreads over 70 sectoral and 530 regional government agencies in a very vast geographical area. In its governmental system, Indonesia practices central government (72 ministerial levels agencies) and regional government (530 local government agencies) with a degree of regional autonomy where each region has the rights, authority and obligation to regulate and manage themselves in accordance with laws and regulations. Hence, maintaining the quality of government services (G2G, G2B, and G2C) poses a great challenge. Many resources are being wasted, synchronization is lacking, and interoperability is impossible. Across the entire government performance has declined and bureaucracy reform is slowing. Coordination among these government agencies is lacking, whilst resources being used are limited. Overall government performances are at stake (Ahmad and Hasibuan 2012). Most of its websites just provide information and news. The important services like FAQ, e-procurement, site and location maps are not provided in most local government websites. It shows that local government has not optimally utilized e-government through the website. Implementation of e-government in Indonesia can be considered less than satisfactory.

2.5.3.9. Saudi Arabia

The Saudi Arabian government uses cloud computing to improve e-government effectiveness and create new business opportunities. It enables the sharing of hardware and software across a large number of users who provide on-demand services with dynamic scalability. There is no need to purchase hardware, software licenses or implementation services; also the cost of accommodation and human resources will decrease. It will provide increased flexibility such as on-demand computing across technologies and reduce new solution implementation times. This approach will be more scalable so capacity can be added or removed as needs change. Essentially it is “pay for only what we use” (Chanchary and Islam 2011).

2.5.4. Lessons learned from previous research literature reviews

From the above literature, we learned that some countries could take advantage of previous literature lessons to apply cloud computing around the world to unite their services in order to increase performance, accelerate procedures and reduce transaction flow. As stated, in Europe, cloud computing will improve GDP, save financial costs and create new jobs. In Britain, the strategy was to use cloud computing to improve government information technology and expand online services. Through these measures, it will enable the government to become a leading force in the use of its services through their portals, raising standards and providing an investment framework for research and development. As for the United States, it’s use of

cloud computing to get rid of the long delays experienced by visitors to government websites during peak times amounts to 99.99% and reduces time as well. Korea has benefited from merging government departments under one roof and establishing permanent laws and policies to make data and information available. Ireland also reformed public services by creating a unified cloud centre that would distribute information to the centres in government networks. As for Japan, the government has set up large cloud computing to gather data and information share and standardise resources to reduce operational costs and benefits, be environmentally friendly, create new jobs, raise the IT market and fill Japan's technology gaps. The development of the software industry and rapid communication between government departments and citizens in China have been accelerated. In Indonesia, the government has tried to use cloud computing to maintain the quality of government services, and to find a solution to waste many resources, interoperability, and raise the level of performance, and get rid of bureaucracy and raise government services on websites. In Saudi Arabia, the efficiency of e-government has been improved and new jobs are created as well as flexibility on demand to add and remove capabilities as needs change with cloud computing.

2.5.5. Difficulties in implementing E-government

Difficulties include issues such as lack of standardisation, lack of interoperability, and lack of resource sharing. Developing countries are continuously facing many challenges in implementing e-government from

budgetary barriers to citizen expectations and seamless services. Furthermore, many developing countries need to change the paradigm in implementing e-government from traditional infrastructure to a cloud environment. The government should choose the best implementation strategy so e-government can be delivered in an effective and efficient way. An effective e-government system should be reliable, cost effective, and easy to maintain, and satisfy other non-functional. Nowadays two main trends in the area of information technology influence e-government. The first trend is the constant development of computer infrastructure that is simultaneously becoming more powerful and less expensive. The second trend is the constant increase in users' skills and knowledge of operating computers. The public sector should take these opportunities to provide e-government based on services.

This study presents an architecture for implementing a cloud environment in e-government based on analysis of current conditions in these countries. This architecture allows greater access to information improves resource sharing and promotes greater standardisation and consolidation of government data. The difficulties in its implementation can be divided into several aspects: data systems, trust, security, usability, content and web design.

The partnership formed may not be optimal, especially in the local government. In human aspects, the ability to use ICT is low. Therefore, an assessment of user acceptance of e-services is required in government institutions. On the other hand, users do not receive enough features and

socialization to use e-government services. On the technological side, there are many problems with regard to cooperation and integration between government institutions. Therefore, there is a need for a standardized framework for e-government services to make it easier for the user to quickly and easily access information.

2.6 *General Data Protection Regulation (GDPR)*

The General Data Protection Regulation or GDPR is a new European regulation whereby companies can collect and use personal data of individuals. This regulation was issued in 2016, but was only implemented in May 2018, replacing the EU directive on data protection from 1995. With GDPR, European citizens' have gained more control over their personal data as organizations will be held responsible for the records they process and they will also achieve a specific consent from the citizens to process it. Despite the fact that GDPR is an European regulation that has no legal authority outside the European, the law applies to any enterprise that collects private facts of European customers, and therefore may have implications for the sports of any company that has commercial enterprise in the European even if this organisation was registered some other place. If any enterprise is located responsible of violating the GDPR, the European can fine this enterprise a penalty as much as four per cent of its annual revenue, which is an excessive penalty, which can quantity to billions of bucks for net giants consisting of Apple and Google. In addition to the obligations imposed on organisations, the GDPR grants customers high-quality rights concerning their data. For

example, users have the right to get entry to the data gathered approximately them, accurate this information if the statistics is wrong, and ask the corporation to delete this statistic absolutely in the event that they need.

Even though the regulation protects the personal records of people within the EU simplest, some companies may extend the rights regarded with the aid of the GDPR to all their customers no matter wherein they may be primarily based. It is likely that a few Omani organisations will should take measures to comply with the GDPR. As an instance, Oman Air collects private facts of EU customers and consequently it is going to need to abide by way of the provisions of the GDPR at the least concerning the private records of those clients.

The GDPR is a top notch instance of ways governments can take measures to shield the private rights of people from the abuse of agencies, but it is also a reminder for us in Oman that we do not have a statistics safety law in any respect, and that there aren't any regulations on Omani agencies in widespread on the gathering of private facts of Omani customers. Governments round the sector are taking movement to defend the rights in their citizens from the privacy abuses of internet companies, and the Omani government need to do the equal.

There are still countless companies struggling to understand the full effect or even its that mean. In the Indian, we found an increased recognition wherein majority of the organisation as close to 74% of them have been privy to GDPR and its impact on them. IT zone has taken a lead in phrases of its GDPR

compliance and greater than 50% of the corporations to whom it is relevant are aware about GDPR and its effect on their organisation. This may be attributed to an expanded push from their customers. The attention needs to be similarly stronger as approx. 26% respondents from organisations for which GDPR is relevant (as they have customers/providers within the European) are not aware of its requirements and impact. The real question is not always just about awareness however additionally about running inside the right route to achieve GDPR compliance it is vital for all organisations that have applicability of GDPR as according to their roles, of processors and/or controllers, to fulfil the required requirements. Heeding to this call of trans-border privacy law, approx. 80% agencies, which might be privy to GDPR, have proactively initiated their compliance adventure closer to it. Consistent with the survey, over 63% respondents who had been aware of its requirements and impact stated that they are non-compliant as on date.

At the same time as majority of them are aware about outcomes of noncompliance to GDPR, they may be yet to finish their compliance journey. There is lots of ground that companies should cover to make sure compliance to GDPR requirements, 31% companies, which accept as true with that they are compliant, IT organisation agencies, have taken a lead with 65% belonging to this area. Manufacturing and car companies out of which 23% trust that they may be compliant with GDPR observe that. With IT group’s main the gap of GDPR compliance, other sectors need to trap up.

Approx. 50% respondents stated that point/bandwidth become the maximum typically said cause for demanding situations confronted by way of the organisations, followed by education and support from top management, whereas 25% of the groups feel that the applicable ones that facilitate the GDPR compliance are lacking. In evaluation to these troubles, there are positive strengths that exceptional groups attribute to their private practices. The respondents believe that one in every of their primary strengths that executed their intention of addressing to the GDPR necessities consist of support from leadership, which turned into quoted as a primary purpose, by approx. 54%. Well-timed schooling and awareness as stated through 20% of the respondents observed this.

2.7 *Critical Success Factors (CSFs)*

2.7.1. What are CSFs

Critical Success Factors (CSFs) were identified and made famous by Rockart (1979) and he gave the first definition of CSFs as a major consideration to those vital areas that give successful potential results. He added that CSFs vary from one organisation to another and, at the same time, vary from one manager or leader to another.

Boynton and Zmud (1984) defined CSFs as surrounding any project with functional aspects and providing the necessary support with continuous monitoring of the success of any institution during implementation. Many

authors have compiled CSF files for e-government implementation and other implementations.

Heeks (2005a) claimed that the main factors for the deployment of e-government vary from country to country. A United Nation reports showed this variation in proliferation among countries and regions (UN 2014).

Al-Mamari (2013) described CSFs as the key catalysts for the creation of an e-government in terms of the geographical nature of the country to ensure excellent services to citizens living in remote areas. Franke et al. (2015) studied factors influencing the implementation of e-government in Saudi Arabia identified the following success factors: religion, family relationships, age structure, population distribution pattern, and tribal heritage. Such success factors were used in conjunction to the strict budget constraints in Saudi Arabia, considering social, cultural and political environment.

2.7.2. The critical success factors in the literature

Most CSF files in the literature will be listed in the table 2.2 below and will be defined in the next table 2.3.

Table 2-2 Critical success factors in the literature

Success Factor	Raised by Authors
1. Strategy	(Gil-García and Pardo 2005; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Franke et al. 2015)

2. Vision	(Gichoya 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Weerakkody et al. 2011)
3. Structure of Organisation	(Gil-García and Pardo 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Weerakkody et al. 2011)
4. Relative Advances	(Gichoya 2005; Gil-García and Pardo 2005; Altameem et al. 2006; Irani et al. 2007)
5. Security	(Rose and Grant 2010; Altameem et al. 2006; Torres et al. 2005; Irani et al. 2007; Weerakkody et al. 2011)
6. Staff Development and Training	(Gichoya 2005; Altameem et al. 2006; Gil-García and Pardo 2005; Torres et al. 2005; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
7. Organisational Culture	(Gichoya 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007; Al-Mamari et al. 2013; Weerakkody et al. 2011)
8. Change Management	(Gichoya 2005; Altameem et al. 2006; Torres et al. 2005; Rose and Grant 2010; Irani et al. 2007)
9. Reward System	(Gichoya 2005; Gil-García and Pardo 2005; Altameem et al. 2006; Rose and Grant 2010; Irani et al. 2007)
10. Top Management Support	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
11. Funding	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Becker Jörg et al. 2004)

12. Citizen Centric	(Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007)
13. Supportive Policies & Legalisation	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Al-Mamari et al. 2013; Weerakkody et al. 2011; Rahman et al. 2014)
14. Geographical Nature	(Al-Mamari et al. 2013)
15. ICT Standards	(Weerakkody et al. 2011)
16. User and Stakeholder Involvement	(Reddick and Anthopoulos 2014a)
17. Good Planning	(Baguma and Lubega 2013)
18. Good System Usability	(Torres et al. 2005; Altameem et al. 2006; Rose & Grant 2010; Kodukula 2011; Irani et al. 2007)
19. Strong Leadership	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011)
20. Good Coordination Between All Project Participants	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
21. Best Practice Consideration	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010;

	Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
22. Make Better Business Process	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
23. Political Support and Stability	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
24. Good Outsourcing Strategy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
25. Supportive ICT Infrastructure/Service Availability	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
26. User/Citizen Computer/Internet Literacy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
27. International Support	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
28. Quality	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)

29. National Information Infrastructure	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
30. Good Partnership with Other Institutions	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
31. Collaboration	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
32. Implementation	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
33. Deal with Bureaucracy	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
34. Citizen Relationship Management	(Gichoya 2005; Gil-García and Pardo 2005; Torres et al. 2005; Altameem et al. 2006; Rose and Grant 2010; Kodukula 2011; Irani et al. 2007; Weerakkody et al. 2011; Al-Mamari et al. 2013)
35. Support Interoperability	(Ray et al. 2011; Irani et al. 2007)
36. Technical Staff	(Torres et al. 2005; Altameem et al. 2006; Rose & Grant 2010; Kodukula 2011; Irani et al. 2007)

37. Good Information Quality	(Khayun and Ractham 2011; Hussein et al. 2007)
38. Good System Quality	(Khayun and Ractham 2011; Hussein et al. 2007)
39. Trust	(Khayun and Ractham 2011; Hussein et al. 2007)
40. Age Structure	(Franke et al. 2015)
41. Education	(Franke et al. 2015; Rahman et al. 2014)
42. Distribution Pattern of Population	(Franke et al. 2015)
43. Family Ties	(Franke et al. 2015)
44. Religion	(Franke et al. 2015)
45. Attitudes Towards Technology	(Franke et al. 2015)
46. Tribal Heritage	(Franke et al. 2015)
47. Awareness	(Papazafeiropoulou et al. 2002; Altameem et al. 2006; Franke et al. 2015)
48. Business Process Reengineering (BPR)	(Hussein et al. 2014; Yin 2000; Altameem et al. 2006).

These factors have been agreed by many researchers in the field of ICT related projects to implement e-government.

2.7.3. Definition of each critical success factor

This study formulates a definition of each factor of success and contributes to increasing benefits for all disciplines and areas of research. This study also suggests a uniform approach to use. Table 2.2 consists of authors who have considered these critical success factors, but did not necessarily identify them in the relevant literature. Table 2.3 below presents definitions of each success factor with corresponding scientists in the context of "e-government" and "information technology". These definitions are summarised in the following table:

Table 2-3 Definition of Each Critical Success Factor

Critical Success Factor	Definition
1. Vision	It is the roadmap that any government can follow to achieve the goals that have been drawn up and objectives set within a period. These goals and objectives become the focal point for all government agencies and departments, who can work together through the implementation process (Burn and Robins 2003; Altameem et al. 2006).
2. Strategy	Any project within a company, an organisation or even a country needs to set a specific plan or strategy to motivate and encourage all of the bodies involved toward achievement of the targeted goals (Burn and Robins 2003; Altameem et al. 2006).
3. Funding	According to Heeks (2001) and Ho (2002), funding is considered to be the primary obstacle confronting e-government implementation worldwide. Most of the developing countries suffer from lack of funding, which can hinder the adoption and implementation.
4. Citizen-centric	Tsohou et al. (2013) considered that citizen satisfaction is the key performance indicator for e-government implementation. Hence, e-services should put citizens at the central point (Tsohou et al. 2013).
5. Top Management Support	This refers to the continuous support of higher management for the adoption and implementation process. Senior management must keep the momentum of the processes at the highest level (Al-Omari and Al-Omari 2006).

6. ICT Infrastructure	This indicates the level of readiness regarding ICT infrastructure to allow the development of the e-government portals, as the latter depends mainly on the proper existence of this infrastructure (Zhao et al. 2014).
7. ICT Standards	Research has found that because government accessibility is expected to be made available to all citizens, organisations and government agencies through an integrated gateway, ICT standards are important to avoid any software or hardware incompatibilities (Layne and Lee 2001; Weerakkody et al. 2011).
8. National Information Infrastructure	It is the highway of the national information related to all the country's institutions and agencies. This information is formulated as a national database of related information (Yanzhao 2009; McLaughlin & Glenn 1995)
9. Collaboration	Citizens all over the world consistently place a low level of trust in their governments. However, social media applications, as an example, have created a new type of collaboration and communication. Therefore, collaboration can take different shapes and forms (Sandoval-Almazan and Gil-Garcia 2012).
10. Security	The software engineering incorporated in all e-government applications and transactions must have within it the required policies and regulations. These regulations include, but are not limited to privacy, intellectual property and data protection (Wangwe et al. 2012)

11. Relative Advancement	This relates to the extent to which the new techniques or the innovations are considered to better than those before (AL-Shehry et al. 2006)
12. Citizen Relationship Management	Citizen relationship management is similar to the marketing strategy which places emphasis on the relationship called market–product. The main idea of citizen relationship management is to focus on the following four-step strategy: designing, serving and protecting citizens (Kannabiran et al. 2005). This is a citizen-focused strategy, which utilises technology to create the optimum relationship with citizens by including their opinions and encouraging their participation (Schellong Alexander 2007)
13. Policy and Legal Issues	Weerakkody (2011) theorised that e-government innovation changed the perspectives of how policymakers see the businesses, organisations and government agencies, on one hand, and their relations with citizens and data, on the other hand. Therefore, the demand for regulations regarding privacy, data protection, crime and hacking has increased in order to organise and protect all elements (Weerakkody et al. 2011; Altameem et al. 2006).
14. Quality	This focuses on the continuous improvement to the services delivered, and the way in which these services reach and are delivered to the public (Weerakkody et al. 2011; Altameem et al. 2006)
15. Reward System	The reward system is a type of staff motivation to improve the quality of their work to reflect positively on the outcome. Simultaneously, this system should also consider and include punishment in parallel to reward (Heeks 1999; Altameem et al. 2006).

16. Implementation	This merely means turning the government's resolutions and planned work on paper to real work on site (Altameem et al. 2006).
17. Training	This is necessary to transfer knowledge and skills to a large group of people, and even to accommodate them in the design and implementation phases for training purposes from different geographical areas. Thus, knowledge is easily transferred to a more substantial number of citizens (Heeks 2006; Heeks 1999)**.**
18. Organisation Structure	Behind the success of any successful e-government project there is a robust organisational structure. It is as simple as a hierarchical diagram which illustrates the jobs, job descriptions, titles and specifications of the holders of the positions (Heeks 2006)**.**
19. Technical Staff	Technical staff is a group of technically professional people who are individually responsible for the development of the components of the system (Heeks 2006)**.**
20. Change Management	Change management is purely the systematic organisational processes which are responsible for the organisation's transition period from one state to another targeted state, based on the organisational vision and strategy. It is widely considered as a critical success factor for any development (Nograšek 2012; Altameem et al. 2006)**.**

21. Business Process Reengineering (BPR)	Yin (2010) defined BPR as "The procedures which are created and strictly followed to utilise the potentials of any organisation up to the maximum" (Hussein et al. 2014; Yin 2000; Altameem et al. 2006)**.**
22. Organisational Culture	Culture comprises the ordinary collection of principles, values and traditions that are found within any organisation's staff (Schein H. Edgar 2010).
23. Awareness	Awareness relates to the process of communicating E-Government to the citizens, agencies and all related stakeholders to create an understanding of its meanings and realise its benefits and advantages (Papazafeiropoulou et al. 2002; Altameem et al. 2006)**.**
24. Support Interoperability	Interoperability means that when a user or citizen wishes to access a specific public service he does not need to apply or ask for that service in many places. There should be one point of contact regardless of what office will be responsible for that service. Interoperability tackles and prevents the heterogeneity of data within the government institutions and supports the integration of information and services (Ray et al. 2011).
25. Dealing with Bureaucracy	Reducing reliance on people behind desks is necessary. Therefore, accessing e-government portals and internet usage by all at any time is a fundamental requirement (Willoughby et al. 2010).

26. Good Partnerships with Other Government Institutions	As a result of e-government integration, portals will enable this type of partnership, and an excellent partnership will provide functional connectivity and maturity (Dwivedi et al. 2011).
27. User and Stakeholder Involvement	In order to widen the meaning, the words user and stakeholder will be substituted with by the word citizens. E-government is a collection of application portals which deal with all services related directly or indirectly to citizens. Therefore, citizens' involvement is the core success factor for e-government implementation (Linders 2012; Reddick and Anthopoulos 2014b).
28. Good Planning	Planning encompasses the way the development is encouraged to be sustainable and promoted to achieve the e-government aims and objectives (Alexander 2009).
29. Good System Usability	This relates to the effectiveness and efficiency of the e-government portals to be used by all users regardless of their domain knowledge, without any difficulties (Friedman-Berg et al. 2009).

30. Strong Leadership	Leadership is connected to the political framework, and specifically the commitment level of the highest rank of government leaders towards e-government projects (Weerakkody et al. 2011). Strong leaders are needed for an e-government implementation process, who can create a vision with an appropriate strategy to achieve it, together with identify the right things to do and resolve any issues (Streib and Navarro 2008).
31. Good Coordination Among Project Participants	This is the process of exchanging information between the project members, government agencies and departments to ensure transparency and enable knowledge partnership among all participants (Estevez et al. 2007).
32. Best Practices Consideration	It is necessary to see what methods others have previously applied successfully to speed up achieving their goals. It is a regular activity, which is widespread and accepted worldwide (Undheim 2008).
33. Political Support and Stability	Political support is analogous to instruments which are used by local government and e-government initiators to motivate them to adopt and implement E-Government initiatives for the sake of citizens' satisfaction (Ahn and Bretschneider 2011).

34. Good Outsourcing Strategy	The process of substitution in the event of a lack in either hardware, software or IT experiences within the organisation or government institutions is important, especially in the developing and least-developed countries, because of the deficiencies of those sources (Heeks et al. 2001; Heeks and Arun 2010; Chen et al. 2012).
35. User/Citizen Computer/Internet Literacy	The ability of the users or citizens to use computers and access the internet. Sometimes this factor is considered under the heading of 'digital divide' or 'awareness', but the definition here is specific to the abilities (Sipior et al. 2013).
36. International Support	This relates to all types of international support, ranging from opening investment opportunities in a developed country to investing in the communication sector, which will lead to the growth of internet access and mobile technology usage (Khan et al. 2012; Brown and Thompson 2011).
37. Age Structure	This is the percentage of age distributions among the population. For example, in Arab countries almost 60% of the population are under 30 years old (Youth-Policy-Press 2016; Franke et al. 2015).
38. Education	The level of knowledge of the available technology and general knowledge of each citizen (Franke et al. 2015).

39. Distribution Pattern of Population	This is the population density in a specific country and the location of concentrations of that population within the geographical map of that country in order to associate public services in an equal manner (Prieto et al. 2014).
40. Family Ties	Family ties are more comprehensive than the relationships within one household; for example, father, mother and children. It includes all degrees of relatives of both family members, and furthermore, the neighbourhood, religious group, and even colleagues in schools, jobs and business (Cengiz et al. 2015).
41. Religion	Religion plays a vital role in conservative societies and should be considered as a vital factor in any change to how citizens will deal with technology (Cengiz et al. 2015; Franke et al. 2015).
42. Trust	Trust can be defined from different perspectives. Kim and Tadisina (2007) collected various views about trust; however, in general trust usually exists between two parties, the trustor, who is worthy of the trust and confidence, and the trustee, the target for the trust. Therefore, in the case of e-government portals, the trustor is the online services, e-services, technology and websites; the trustee is the citizens (Euijin and Tadisina 2007).
43. Attitudes Towards Technology	These can be defined only as the individual level of adoption, awareness, education, willingness and usage of new technology. It is the social concept of the relationship between the individuals and the ICT (Mitcham 1994).

44. Tribal Heritage	This is related to the cultural aspect of the population and its relationship with a country or countries. The African and Asian population are famous for this social structure, which is a form of family, ethnic groups or minorities who live in a country or several countries. Usually, the tribe is socially and politically related to the tribe leader (Bwalya et al. 2014).
45. Geographical Nature	The geographical nature of any country is different to others. For example, a comparison of Qatar with Oman or Australia and the United Kingdom shows that they are entirely incomparable. Therefore, it is a critical factor on which to focus, as it is difficult for a government agency to deal with people in vast areas on a one-to-one daily basis (Willoughby et al. 2010; Al-Mamari et al. 2013).
46. Good Information Quality	This is the standard of the content of any services, goods or information that encourages citizens or customers to use or buy that type of quality service (Lopes and Galletta 2006)
47. Good System Quality	This relates to the level of permissions that are given by the system portals to citizens for them to obtain the services they need with high quality, flexibility, within the expected time and smoothness (Liang et al. 2011).
48. Good Service Quality	This is the extent to which the services provided meet the client's, citizen's or customer's expectations (Liang et al. 2011)

As Karlsson et al. (2017) mentioned that the critical success factors which mentioned above are not constant, as they change constantly over time (Karlsson et al. 2017). Therefore, there is the possibility of new factors emerging on the basis of environmental issues and conditions.

2.8 *Summary*

This chapter creates a theoretical background for the entire research. It provides the reader with the necessary background about the e-government topic and its adoption for the last two decades. The chapter highlights the role of cloud computing; and moving countries to clouds with examples countries. The success factors of e-government are collected from different perspectives and then utilised to create the theoretical framework for a proposed improved e-government services. Prepare the bases to establish a discussion background for the next chapters.

Chapter 3: Research Methodology

3.1 *Introduction*

This chapter presents the design of the research perspectives and methodology of the study of e-government services. It provides a description of the selected research methodology through explaining the following points. Firstly, it defines and explains the methods of data collection, the methods that have been used to achieve the research targets and to answer the research questions in this study. Secondly, it focuses on the process of analysing the data, detailing tools and systems that have been used for data analysis. Finally, the validity and reliability of the study are explained as well as a discussion of the ethical issues concerned in the study.

3.2 *What is a research methodology?*

Crotty (1998) defined research methodology as “the strategy, plan of action, process design lying behind the choice and use of particular methods and linking that use of methods to the anticipated outcomes” (Crotty 1998: 3). Wilson (2014) defined the research methodology as a specific path followed by the researcher to obtain solutions and answers to his/her research questions. This is to provide a proposal to decision-makers and relevant stakeholders in the study without losing the ultimate goal plan. Due to the lack of empirical studies in this context and the lack of adequate resources, a fact-

finding experiment was conducted in the form of exploratory research to explore the current situation (Wilson 2014).

The methodology is one of the most important factors in any research project; therefore, it is important to choose the most appropriate methods for each. (Blaxter 2010: 183) explains that “all research involves the collection and analysis of data, whether through reading, observation, measurement asking questions or combination of these or other strategies”. Similarly, (Bryman 2016: 46) describes research methods as “a technique for collecting data. It can involve a specific instrument, such as a self-completion questionnaire or a structured interview schedule, or participant, observation, whereby the researcher listens to and watches others”.

3.3 *Research Approach*

The choice of research methodology for this research depended upon the issue being addressed. As discussed in Chapter 2, there is a requirement for more research to explore the impact of unified approach of e-services on government cloud in public sector institutions. Subsequently, the fundamental purpose behind this study is to investigate this relationship and to accumulate data that provides an in-depth perspective on the phenomenon under investigation. Moreover, by the use of more than one method, the research aims to expand the credibility and reliability of its findings. Accordingly, a mixed methods approach, which combined both qualitative and quantitative methods, has been selected for this study.

3.3.1. Quantitative vs qualitative

Reviewing the literature and techniques of research methods that have been incorporated in the previously described research philosophies and tracked to collect primary data has shown that the methods used can be categorised into two research principles: qualitative and quantitative research methods. Each of these two methods generally follows an exceptional school of philosophy or thinking (Ittner 2014).

Quantitative research is a widely used method of research when the objective is to examine theories or hypotheses, to collect descriptive information or to test relationships between variables. These variables are measured and digital records are statistically analysed. Quantitative data can be obtained to provide a measurable guide and help to prepare the causes and effects for effective data chain actions. It creates an opportunity for replication and generalization on the population, to facilitate evaluation of groups, and to provide insight into a range of experiences (Creswell et al. 2011; Creswell and Clark 2017).

3.3.2. Mixed Methods

Denzin and Lincoln (1994: 5) state that “the use of multiple methods, or triangulation, reflects an attempt to secure an in-depth understanding of the phenomenon in question.” Thus, to achieve more accurate and reliable data, it is necessary to use more than one method instead of using only one method, because each method provides information and the data will have breadth and depth (Thomas 2017). In addition, the results of one method of study can be

compared to other results that are found from alternative methods (Blaxter 2010). In general, the researcher's multiple methods allow greater confidence in results (W Creswell 2016). Thus, the mixed method approach provides alternative but complementary sources of knowledge relevant to the phenomenon under consideration in order to address the research questions. Hence, the research generates richer and more credible results (Archer 1988). For these reasons, a mixed methods approach has been used in the most appropriate way in this study to address research questions.

Mixed methods research is when a researcher uses quantitative and qualitative research methods in their study, series of data collection and analysis. It can be argued that with the aid of combining all kinds of research, the limits of every approach can be balanced and loopholes can be anticipated in records (Creswell et al. 2011; Creswell and Clark 2017). For this reason, the mixed-mode method was once used in this lookup context, and in all in-depth interviews (Creswell et al. 2011; Creswell and Clark 2017). The intention of a qualitative method is typically to acquire data from people and to grow to be acquainted with subjects, permitting them to expand on theories; whilst a quantitative research method has the goal of testing theories for evidence to determine whether it is a useful resource or to refute a hypothesis (Creswell et al. 2011; Creswell and Clark 2017).

First of all, it is essential to think about the differences between the different types of methods, which are outlined in Table 3-1.

Table 3-1 Differentiates between qualitative, quantitative, and mixed methods approaches

Quantitative Methods	Qualitative Methods	Mixed Methods
Pre-determined	Both predetermined and emerging methods	Emerging methods
Instrument based questions	Both open and closed ended questions	Open-ended questions
Performance data, attitude data, and census data	Multiple forms of data drawing on all possibilities	Interview data, Observation data, document data, and audio visual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Across databases interpretation	Themes, patterns interpretation

Source: (W Creswell 2016: 17)

As shown in Table 3-1, a mixed methods approach incorporates the combined strengths of both qualitative and quantitative methods. Moreover, it can be seen that mixed methods are integrated between statistical analysis and text analysis. However, mixing methods could be expensive and time consuming. In addition, it requires that the researcher be familiar with both qualitative and quantitative methods (W Creswell 2016). The selection of a mixed methodology for this study will now be explained and justified.

3.3.2.1. Mixed method objectives

The main objectives of using mixed methods in this research are:

1. The need for further research to explore the impact of a unified approach of e-services on a government cloud, and the need to explore this phenomenon from different perspectives and through different methods as well as at different levels of management.

2. The research uses a sequential exploratory design where the qualitative method precedes the quantitative method. This requires qualitative data collection and data analysis. Once the results of the qualitative phase are completed, quantitative results can then be reported to better understand what the large-scale issues have been.

3.4 *Research Design*

Creswell (2016) showed different types of mixed methods that could be used in this type of research. There were three basic types to be considered:

1. Convergent parallel mixed methods.

2. Explanatory sequential mixed methods.

3. Exploratory sequential mixed methods.

In parallel mixed methods, the combined methods are used simultaneously as the researcher integrates qualitative and quantitative data to supply a complete analysis of the study issue. In combination, in the explanatory

sequential mixed methods, the researcher starts with qualitative methods and then analyses the data before designing the second method based on the results of the first to explain what was found in more depth in the quantitative method.

The third type of mixed methods research design is the exploratory sequential mixed method approach that involves rich and in-depth data collection to explain the phenomenon under investigation from the views of participants at different levels in each institution. The initial phase of the research design uses qualitative methods, the results of which are then explored in a quantitative stage. Thus, the qualitative method is implemented first and reports its findings in the quantitative method. Therefore, the data from the quantitative methods are analysed by the researcher to explore the results of the primary methods on a wider scale.

This study also seeks to explore the role of unified approach of e-services on a government cloud, and an exploratory sequential mixed methods approach was considered most appropriate.

3.4.1. Exploratory Sequential Mixed Methods

Mixed methods research involves the integration of qualitative and quantitative research. Thus, mixing qualitative and quantitative methods involves the use of conflicting methods in terms of their basic cognitive assumptions. However, Creswell (2016: 16) explains that, in exploratory sequential approach, the researcher “first begins with a qualitative research phase and explores the

views of participants. The data are then analysed, and the information used to build into a second, quantitative phase". The purpose of using researchers for this method is the approach to collect information from the individual to identify subjects, which can develop theories in depth. In contrast, the use of the quantitative approach aims to test theories in a deductive way to look for evidence to support or refute the hypothesis (Creswell et al. 2011; Creswell and Clark 2017) and to explore the role of unified approach of e-services on government cloud. Therefore, for that reason the researcher used a mixed method to this research context, whether in interviews or in-depth surveys(Creswell et al. 2011; Creswell and Clark 2017).

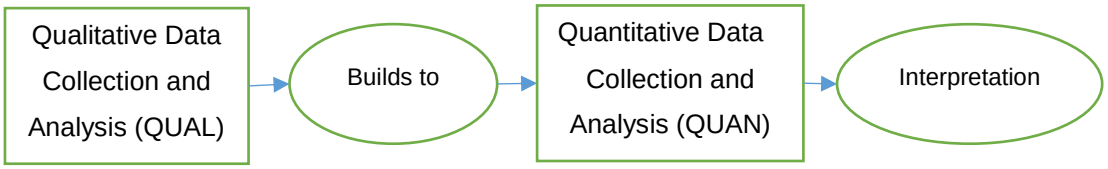

Figure 3-1 Exploring Sequential mixed methods

Source: (W Creswell 2016: 220)

According to Creswell (2016), the researcher follows a three-step procedure in exploratory sequential mixed methods: the first stage is exploratory; then the instrument is developed; and finally, the instrument is used with a pattern of the population. In addition, data from exploratory sequential mixed methods research are collected in two stages: the first with the collection of qualitative data and then followed by quantitative data collection. Therefore, this strategy can be used to decide whether qualitative results can be generalised to a larger sample (W Creswell 2016).

3.5 *Methods of Data Collection*

Based on the study conducted by Bryman (2016), the data collection stages represent the basic stage of any research study. The following sections discuss the different tools used to collect data.

3.5.1. Qualitative Methodology

Since this study seeks to gain an in-depth understanding of the practices and experiences of the unified approach of e-services and their impact on the government cloud, a qualitative method will be used, namely semi-structured interviews.

3.5.1.1. Semi-Structured Interviews

Bryman (2016) and many other authors point out that the most regularly used method in qualitative research is the interview. Kvale (1997) defines the interview as an exchange of opinion between many people on a specific issue of common interest, understanding the importance of human communication to create knowledge and highlight the social data of research data. According to (Blaxter 2010: 193):

“The interview method involves questioning or discussing issues with people. It can be a very useful technique for collecting data which would likely not be accessible using techniques such as observation or questionnaires”

One of the most common methods for interpreting an information system is interviews (Walsham 2006). There are three main types of interview used in

qualitative research: unstructured interviews; structured interviews; and semi-structured interviews (Bryman 2016).

In qualitative interviews, the perspective of the researcher participants is sought more deeply than is possible in quantitative methods. It is therefore important to include a qualitative method in order to explore more hidden facts by digging deeper into the institutions selected for this research. Therefore, this study chose to use semi-structured interviews to more deeply explore the issues in the research questions. Bryman (2016: 212) defines semi-structured interviews as “a context which the interviewer has a series of questions that are in the general form of an interview schedule but is able to vary the sequence of questions”.

For this research, semi-structured interviews were conducted face-to-face because this was more appropriate to elicit the viewpoint of interviewees in order to address the research questions. Moreover, the responses to these interviews were expected to give a clear understanding of how a unified approach of e-services affects the implementation of a government cloud. However, in semi-structured interviews, the interviewer has the opportunity to ask further questions for clarification and further clarification of the interviewee's responses.

Interviews were carried out in Arabic, the mother tongue of participants. This allowed participants to have more flexibility in explaining and giving full answers without any language barriers to explain what they wanted to say.

Selection of Participants

The results and selection of appropriate institutions were one of the key decisions to be taken in the research design. All public institutions in Oman have individual plans for the implementation of the government cloud. Consequently, due to the time constraints and the 80 public sector institutions in Oman, this study selected a sample of 17 institutions to be covered by the research. Institutions were selected in order to ensure that institutions of different size, structure and type of service providers are considered. Moreover, these differences in regulatory environments allow for useful comparisons to be made during data analysis. In addition, it allows exploration of whether the type of institution has any effect on the implementation of the government cloud.

It was therefore very difficult to know how many interviews would be needed to obtain all the data required to cover the research questions. Bryman (2016: 425) points out that:

“In general, sample size in qualitative research should not be so small as to make it difficult to achieve data saturation, theoretical saturation, or informational redundancy. At the same time the sample should not be so large that it is difficult to undertake a deep, case-oriented analysis”.

The researcher identified the point at which no other relevant data were added to previous interviews, the level of saturation. Once the point is reached where no further new ideas are revealed, this is known as saturation point.

Consequently, key participants were selected according to their job title and responsibilities. The interviews covered three different types of stakeholder: top level management; middle management; and the operational level. This was to ensure that the data collected represented different key players at different levels in the implementation of the government cloud in the institutions as well as increasing the validity and reliability of the research. The interpretation of each stakeholder is as follows:

1. **Top Management Level:** These key stakeholders are the decision-makers who plan, develop or approve the strategy plan in public sector institutions. However, those selected from this level of management represent different functions, such as IT General Manager, Directorate and General Manager of Infrastructure Operations Division. Thus, this would provide clarifications and understandings on the decisions taken in the relevant government institutions. In addition, the main objective was to cover a sufficient number of participants, including IT planners. In addition, the questions are designed for decision makers to explore how their role as decision-makers affects the strategy and process of implementation of the government cloud. Moreover, as noted in chapter 2, the highest level of management is very important in the context of a unified approach to e-services as it participates in shaping the e-services approach.

2. **Middle Management Level:** This level covers key persons in the middle management level, who are accountable for the implementation

of the government cloud. This level is important as it sits in the middle between strategic planners (top management level) and the operational level. This level represents staff such as the head of the IT department, the project manager in the IT department and the head of the database department.

3. **Operational level:** The study included those who worked in the implementation of governments in these institutions, representing employees who worked in the IT department such as web designers and developers, database developers, system analysts, network engineers and IT technical support staff. This level was considered useful in exploring how the implementation of the government cloud was influenced by the different factors of a unified approach to e-services as the main stakeholders responsible for implementing strategic decisions in the field.

Table 3-2 shows the number of interviewees who were contacted and those who agreed to participate from different levels in each institution.

Table 3-2 Number of people selected, selected and represented levels

Interviewees Type	Number of people contacted	Number of people agreed to participate
Top Management Level	5	3
Middle Management Level	18	14

Operational Level	9	4
Total	32	21

The second column in Table 3.2 shows the total number of people (32) contacted by the researcher to participate in the study representing the three different types of stakeholders. Column 3 in Table 3.2 shows the number of people who agreed to participate in this study. Each post was conducted by the researcher via e-mail and some by telephone to ask them whether they would participate in the interview and contribute to the study. If they agreed to participate in the study, they were asked to send the consent form before the interview and they were informed of their right to change their minds and the right to withdraw at any time without giving any reason.

Interviews were conducted between September 2017 and January 2018 and were conducted in Arabic. Face-to-face interviews were conducted in the participants' offices. All interviews were recorded with the permission of interviewees, with the exception of 9 participants who did not wish to be recorded. Therefore, observations were taken by the researcher during these interviews.

Interview Design

Semi-structured interviews were designed to motivate the candidate to explain what happened and give further details. Consequently, open-ended questions were used in the interviews to allow the researcher to explore, investigate and

reach below the surface. Moreover, these types of questions were expected to help obtain data from respondents more effectively than closed questions because this would give the interviewer the space to interpret and cover some areas that the researcher might not have anticipated and would not allow for the desired level of detail. In addition, this gave the researcher the opportunity to ask different questions based on the responses provided by the participants. The researcher was careful not to control the interviews to the extent that would inhibit respondents from giving any details they wished to disclose and lose a lot of unnecessary history of the critical importance of this research (Orlikowski and Baroudi 1991). A copy of the interview questions is contained in Appendix A.

Participants were provided with enough information about the research, the purpose and objectives of the study. In addition, participants were given two different documents, information sheets and ethical approval form, samples in Appendix A. (Bryman 2016) stated that the consent forms would help participants to be completely independent of the nature of the research and the impact of their participation. Further clarification was offered by the researcher if any participant subsequently raised any concerns as they signed the approval document. However, asking the participants to sign this document led to the refusal of some participants to participate in the study, for example, in the case of a manager who agreed to initially agreed to participate, but later refused to sign the approval form after they had asked the Director. However, due to ethical considerations, it was extremely important that participants sign consent forms. Therefore, each participant received a copy

of the information sheets containing the contact details of the researcher if they wanted to contact the researcher at any time about their participation. The average length of the interview was designed from 40 to 50 minutes. The interview questions were divided into four major issues.

The first group of interview questions aimed to explore the standards used by the United Nations to classify e-government services and how the framework of portal services could be measured if websites were not set up according to the International Classification of the UN. The second question aimed to discover how unified approach e-services could affect the acceptance of using the Oman portal. The third question aimed at exploring the integration and improvement of e-government services and speeding up the procedures with time calculation. The fourth question aimed at discovering the reasons why developed countries were the top of the UN list of the e-government report. In addition, it was asked if there is any acceptance in using a common e-platform (G Cloud) for government services that avoids any pressure on the network in peak times.

The researcher embraced the various themes that emerged from the literature review as potential issues to be explored in interviews and devised the questions accordingly. Interviews were chosen as a data collection instrument because they are able to provide more in-depth insight into each of these factors and give rich and detailed information (Flick 2014).

Piloting and Pre-testing interviews

The number of participants involved in testing and pre-testing of interviews varies from study to study. Kim (2011) refers to two participants in the pilot study, while Connelly (2008) recommends 10% of participants. However, in this study, a pilot test was conducted with participants in semi-structured interviews, which amounted to about 10% of participants. This pilot study was intended to test the interview questions to determine whether the questions were clear and unambiguous while maintaining an open approach (Kim 2011). It also allowed testing of the sequence of questions and their flow, and whether they should form part of the final interviews or whether they should be deleted (Beebe 2007). In addition, some expectations could be developed for the types of responses and responses likely to be received, and whether the interviewer needed further clarification.

The pilot test also enabled the researcher to test the average time of each interview. It was also possible to test the recording device to be used for recording the interviews, as well as testing the sound quality. In addition, the interviewer was able to develop confidence in interviewing and effective techniques. Some modifications were made resulting from the pilot interviews, such as adding several sub-questions to two key questions, which were unclear for participants in the pilot study.

3.5.2. Quantitative Methodology

As mentioned previously, this study used an exploratory sequential mixed method. Therefore, after the qualitative method is performed and results are analysed, the quantitative method is designed. The instrument used for quantitative data collection was a survey.

3.5.2.1. Survey objectives

The main objectives of the survey are:

1. To provide an improved and experimental framework for e-government services for Oman and for any developing countries wishing to provide government services through the Internet.

2. To build on results of the interviews and the extent to which these services are integrated among government institutions.

3. To evaluate the user's acceptance of e-government services and raise the efficiency of use of these services based on the factors of success.

Participants were selected randomly, with each individual or member of the institutions having an equal opportunity to be chosen from among the target population. The aim was to cover as many of the 80 public sector institutions in Oman as possible, in order to support and strengthen the data gathered in the previous phase. These eighty institutions are presented in Appendix E. Twenty-one interviews from 17 institutions were recently from the total public

government sector institutions. In addition, 432 participants participated in the survey.

3.5.2.2. The Survey Design

The survey is designed to be distributed online via the Smart Survey Web. This site was used because it supported a multilingual questionnaire that enabled participants to choose the language of their choice before starting. The survey was designed in two different languages, namely Arabic and English. The researcher verified that the two versions were identical in the translation. In addition, Smart Survey Web is provided through various devices such as computers, smartphones and tablets. Experimenters found that some web survey creators were not compatible with some devices, especially smartphones. This was one of the reasons why Smart Survey Web was selected as the best platform for this survey.

In addition, this website provided a different design for questions that were not found in most free survey sites. In fact, this is one of the main considerations when choosing a web poll creator.

The survey was divided into three main sections as shown in Figure 3.2 bellow. A copy of the survey distributed is provided in Appendix B. An information sheet was included at the beginning of the survey and participants were clearly informed that if the survey was returned with completed responses, it would be considered as their consent to participate in this research. The participants' information paper explained the objective of the study and further information

such as that their answers would remain confidential and any identifying information would be removed to ensure anonymity.

Section One: Background Information:	Gender, age, using internet and e-services, employment, e-services institution names, residence, distance to government services
Section Two: Factors affecting e-government services:	Factors affecting e-government services: 1. Infrastructure of network availability and mobile network (Q10, Q11). 2. Trust (Q12 to Q14). 3. Content (Q15 to Q18). 4. Usability – Speed of service (Q19 to Q21). 5. Quality (Q22, Q23).
Section Three: The impact of unified approach of e-services on government cloud	Effectiveness of unified approach of e-government services Unified approach of e-government services (Q41 to Q42.9) Cloud computing (Q43 to Q45)

Figure 3-2 Questionnaire questions structure

Section One: This was designed to get general information about participants. Including gender, age, employment, use of the Internet and e-services, and users' class such as citizen. This information helped to compare institutions and categories of results according to different classification criteria. To this end, each institution was given a symbol from A to AH, which is explained in more detail in Chapter 6.

Section two: This section aims to build on the results of the qualitative method. There are 32 questions included in this section. Most of the questions employed the 5-point Likert scale to indicate the participants' degree of agreement or disagreement with each statement, where: 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree. The 5-point Likert scale was used appropriately for participants to determine which choice matches their view more closely (Best 2014). These questions begin at question 10 in the survey, until question 40. Thus, the questions represent various issues of qualitative data such as infrastructure, trust of using e-government services, content in the websites, usability (speed of service), quality of e-services, security issues, web design, rules and finally the unified e-government services in the government cloud.

Section three: This section also aims to build on the results of qualitative methods and includes 13 questions. All questions in this section also used the 5-point Likert scale.

3.5.2.3. Piloting and Pre-testing the Survey

Bell (2014: 151) states that:

"All data-gathering instruments should be piloted to test how long it takes recipients to complete them, to check that all questions and instructions are clear and to enable you to remove any items which do not yield usable data".

A pilot test was conducted with 33 survey participants. The pilot test allowed the researcher to test the survey and review the survey questions. Furthermore, it assisted the survey design and planning in helping to determine the length of time that was used to complete the survey. It also helped to verify whether the survey had any practical or contextual issues that could affect the data collection process, such as whether it should be opened by different devices such as smartphones, tablets, and computers.

Accordingly, all comments and reviews were collected from participants in this pilot test and used to modify the draft survey. Some comments suggested changing the words of some phrases to be simple and clear language for participants. Changes to the survey were implemented according to reviews and then distributed.

Data collection for quantitative methods was started through the distribution of the survey from 01 December 2018 to 31 January 2019. The online survey link was distributed to all managers in public sector institutions to be distributed to all employees in their institutions. The researcher used e-mail, social media

such as Twitter, WhatsApp and Facebook to send the link to reach many employees.

3.6 *Data Analysis*

The study used an exploratory sequential mixed method approach. The researcher analysed the two methods separately. Furthermore, the researcher used the data found from the initial qualitative method of construction in the second quantitative method of data collection. Therefore, the next section will explain how these methods can be analysed.

3.6.1. Thematic Analysis

Thematic analysis is a method in which the researcher performs in-depth analysis of qualitative data using a coding and pattern matching process that is applied to the collected qualitative data. This method is easy to use and relatively accurate (Boyatzis 1998; Braun and Clarke 2006; Garner and Ragland 2015). It is similar to the content analysis (Wilkinson 2000) in that it directly depends on the researcher's interpretation and understanding.

The flexibility and accessibility of thematic analysis are significant for use in this research study. In addition, its ability to summarize the main features of a large amount of data (Braun and Clarke 2006). The data sample was suitable for using this method, which was a simple and limited number of participants.

3.6.2. Interviews Analysis

The technique used was to analyse the corresponding objective analysis. Bryman (2016) reported that objective analysis is one of the most widely used methods for analysing qualitative data. Brown and Clark (2006: 79) define objective analysis as "a method for identifying, analysing and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail"

According to Smith (2015), an objective approach may be applied either for exploration or confirmation purposes. Hence, this study was used to explore the relationship between the unified approach of e-services and the implementation of the government cloud.

3.6.3. Survey Analysis

As a first step in the data analysis, online and online surveys were integrated into the same file. The file was downloaded to the SPSS version 25.0 statistical package for analysis. The analysis process was started by coding and determining the variables used in the survey. Babbie (2015: 425) defines the code book as a document that helps analyse data and "identifies the locations of data items and the meaning of the codes used to present different attributes" (see Table 3.3). The data were then explored using descriptive statistical tests to explain the relationship between variables in the data.

Table 3-3 Survey questions

Section	Main questions for variables in the survey	Sub-questions for variables in the survey	Coding Instructions
Section One: Background Information	Gender		1. Male 2. Female
	Age		1. 19 - 24 2. 25 - 34 3. 35 - 44 4. 45 - 55 5. Over 55
	Use of internet		1. Always 2. Usually 3. Sometimes 4. Never
	Employment		1. Yes 2. No
	Use of e-government services		1. Yes 2. No
	Status		1. Citizen 2. Resident 3. Visitor 4. Business 5. Government employee 6. Private employee
	e-service institution name		1. Ministry of Finance 2. Ministry of Education 3. Ministry of Higher Education 4. Institution of Public Administration 5. Ministry of Health

			6. Ministry of Housing 7. Ministry of Manpower 8. Ministry of Civil Services 9. Ministry of Environment 10. Ministry of Justice 11. Ministry of Commerce and Industry 12. Ministry of Inertial 13. Royal Omani Police 14. Ministry of Heritage & Culture 15. Ministry of Endowment and Religious Affairs 16. Ministry of Tourism 17. Information Technology Authority 18. Other
	distance to government services		1. Local 2. 25 Km 3. 50 Km 4. 100 Km 5. +100 Km
	I have the ability		1. Internet access at home only 2. Internet access at work only

			3. Internet access at Internet café only 4. Internet access through mobile 5. I have no access
	I use e-government through		1. Server (Computer) 2. Cloud (Smart Devices & Applications & Platforms) 3. Both server and cloud 4. None of them
	1. Trust	Q12. I encourage the formal government institutions to expand their e-government services	1. Strongly Agree 2. Agree
		Q13. E-government can reduce travelling long distances to obtain government services	
		Q14. E-government services have the ability to perform the promised services accurately	
	2. Content	Q15. Headings (e.g. titles of e-government services) are not	

		clearly phrased, descriptive and understandable	3. Neutral 4. Disagree 5. Strongly Disagree
		Q16. Using e-government services provide me what I require	
		Q17. The information provided by e-service is accurate	
		Q18. E-service not provides the information content, which meets my needs.	
	3. Usability – Speed of service	Q19. I accomplish my tasks easier and quicker with e-government services	
		Q20. Using e-government service improves the quality of work I do	
		Q21. The expected less time to finish the e-government services	1. 5 min – 15 min 2. 16 min – 30 min 3. 31 min – 45 min 4. 46 min – 60 min 5. More than 60 min
	4. Quality	Q22. I get very good quality out of e-government services	

		Q23. E-government service works very well technically	
	5. Security	Q24. There is an appropriate procedures in e-government services to prevent accidental loss of data	
		Q25. When using e-government services, I believe that certain managerial and technical procedures are implemented to protect my personal information	
		Q26. I believe that my confidential information is kept secure	1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
	6. Web design	Q27. Government websites are not organised logically by anticipated user need	
		Q28. I am not satisfied with design of e-service	
		Q29. E-government services	

		attractively display information	
	7. PE	Q30. I would like use e-government services anyplace	
		Q31.Using e-government services will make my life easier	
	8. EE	Q32. My interaction with e-government services would be clear and understandable	
		Q33. Operate e-government services would be easy for me	
	9. FC	Q34. I have the necessary knowledge to use e-government services	
		Q35. I can get help from others when I have difficulties using e-government services	
	10. SI	Q36. People who influence me think that I should use e-government services	
		Q37. Most people surrounding with me use e-	

		government services	
	11. BI	Q38. I prefer to using e-government services	1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
		Q39. I intend to use e-government services	
	12. CV	Q40. I believe that using e-government services is a good value for money	
Section Three: The impact of unified approach of e-government services on government cloud	Unified approach of e-government services on government cloud:	Q41. I think the framework of e-government services differs between countries making it difficult for people to access e-services	
		Q42.1. I can get help from others when I have difficulties using e-government services.	
		Q42.2. Secured	
		Q42.3. Comfortable web design	
		Q42.4. Easy to use	
		Q42.5. well organised content	
		Q42.6. Information quality	

		Q42.7. will affect social impact	
		Q42.8. Will be trusted as it will be a standard model for most countries for the same list of services	
		Q42.9. reduce the financial cost	
	Cloud computing	Q43. Cloud is a secured space for saving data.	
		Q44. I trust using the government cloud.	
		Q45. I have knowledge of what e-government services on cloud.	

The code book explains the name of the variable as used in the questionnaire, which is the quick title name of the variable used in the SPSS program, as appropriate for the small code for incoming responses. This has helped to classify each of the variables in the survey to be suitable for use in SPSS. In total, 605 respondents completed the survey. However, after the first evaluation, it was found that 173 of these participants were irrelevant or might not wish to be included in learning now for various reasons. Fourteen

respondents had not responded to any of the survey questions along with the basic statistics section, and 159 participants were not included because did not complete the survey questions.

Therefore, in order to avoid statistical examinations from an incomplete set of 173 units of mostly preventive facts, these participants' data were excluded. However, 432 individuals were covered in this analysis, which is 71.5% of all respondents. In order to determine which deductive test will be appropriate, the nation's daily statistics will be examined using Shapiro-Wilk and take a look at the Kolmogorov-Smirnov tests. The full impact of survey analysis is presented in Chapter 6.

3.7 *Validity and Reliability*

Babbie (2010: 153) defines reliability as "a term describing a measure that accurately reflects the concept it is intended to measure". In addition, Creswell (2014) explains that for qualitative validity, researchers must use different procedures to examine the validity of the results in their studies. While Babbie (2015: 150) defines reliability as a "quality of measurement method that suggests that the same data would have been collected each time in repeated observation of the same phenomenon".

Therefore, the validity and reliability of both qualitative and quantitative methods must be verified, which, for this study, was done while selecting the appropriate methods for data analysis as well as during the selection of participants and organisations by addressing the following techniques:

1. Mixed methods have been used in order to support the reliability and validity of the internal study. The use of mixed methods is intended to improve the researcher's ability to measure the accuracy of existing data as well as to convince readers of accuracy, because the use of different methods will confirm topics that are formed from specific sources of data or different views of participants and thereby enhance the validity of the study (W Creswell 2016).

2. As this study used mixed exploratory sequential methods, in order to increase the validity of the study it was necessary to confirm that the individuals who were sampled in the first method were not included in the second method and vice versa. This was particularly important as both phases of the study used the same population (public sector institutions in the Sultanate of Oman) and any double participation could provide unnecessary repetition of the responses (W Creswell 2016).

3. All procedures for data collection and data analysis were described in detail to ensure a clear view of the methods used in this study.

4. The researcher presented the positions of the interviewees to ensure the reliability of the interviews.

5. Term distribution of the survey is two-months period of time, as well as online and offline distribution to ensure that everyone had equal opportunity to participate.

6. Creswell (2016) states that pilot testing is necessary to create content for surveying and promotion of questions, as well as planning and metrics. Through piloting, and the collection of comments and amendments, and by reworking questions that were not obvious to participants, the researcher could confirm that all the questions for the study were understood and presented in a coherent order. In addition, pilot studies allow for the appropriate length of time to be allocated to each method.

7. Creswell (2016) mentions that one of the internal polls in valid threats is that the selection of participants can be according to specific characteristics that can be discarded to obtain certain results. Therefore, in order to avoid this threat to the reliability of the study, the researcher randomly distributed the survey, so the characteristics had a fair distribution between participants and institutions.

8. Creswell (2016) states that the researcher must ensure the reliability of qualitative methods by verifying that the scripts do not contain any errors that can occur at the transcription stage. Moreover, researchers need to check the meaning of all subjects to ensure that there is no deviation in their meaning during the coding stages. Therefore, all these steps were taken by the researcher in this study in order to increase the reliability of the study.

3.8 *Ethical Considerations and Procedures*

Gravetter and Forzano (2018) defines research ethics as a duty for scientists to be explicit and respectful to all people who will be affected by the study or the results of the study. Therefore, this study follows ethical rules as provided in the university guidelines for research.

In interviews, interviewees are entitled to answer all or part of the questions posed by the researcher. In addition, interviewees will have sufficient information about the researcher and the purpose of the study and how the researcher will use the data collected from the interviews. In addition, all participants' information and the names of their organisations will be anonymous. However, the title of their site has been mentioned in order to ensure the validity and reliability of the internal study. In addition, interviews were recorded only after obtaining permission, and the recordings were used by the researcher solely for the purpose of study. Any audio records of the interview data will be securely locked in the researcher's office and deleted after the research has been completed. All of this information was communicated to the interviewees by giving them an information sheet and statement of consent as part of the ethical considerations.

According to the results of survey, participants had sufficient information about the researcher, what the purposes of the research were, and how the information was collected. All this information was highlighted in the information sheet and was clearly presented to all participants in the first part of the questionnaire and before any questions could be answered. In addition,

the survey was distributed online, and the data was saved securely, and password protected, so that no other person could access the data except the researcher. In addition, the researcher did not ask the participants to disclose their names or any personal information such as addresses and phone numbers, thus ensuring protection of the respondents from any future damage from the survey.

3.9 *Summary*

In conclusion, this chapter has discussed the subject of the research from the design perspective of the methodology and then highlighted the use of qualitative and quantitative methods. The research took the form of an exploratory sequential mixed methods study, consisting of interviews as an initial stage, and then using a questionnaire survey as a back-up tool to support the interpretation of the data collected by the qualitative method. Analysis of the interview data was conducted through the QSR NVivo 11.0 software package. Quantitative data was analysed using SPSS version 25.0. Finally, this chapter discussed the validity and reliability of the study as well as ethical considerations.

Chapter 4: The Government Perspective; Initial study

4.1 *Introduction*

E-Government, though some consider it an outdated term, is perceived as a one-way channel to provide government services in an electronic format in order to achieve benefits such as greater affordability, reduced bureaucracy, and timely and open service provision to all. Digital government is argued to be its rebranding. Andrea Di Maio (2013) argued there is a progression from e-government, to the joined-up (or citizen-centric) government, to the open government and finally smart government (i.e. affordable, sustainable and cross-boundary). Also, digital government implies both open government and smart government principles and is indeed very well distinct from e-government. He also argued that US open policy, UK digital strategy, the Danish approach to data, and in many developments across the world, differences between e-government and digital government are becoming apparent, stating that digital government is not a rebranding of e-government, nor are the governance and architectural changes cosmetic (Di Maio 2013).

The Centre For Technology in Government (2017) defines e-government as “the use of information technology to support government operations, engage citizens, and provide government services”. Therefore, its future will cover the functions of:

- E-services - the use of the internet to deliver government services and programmes.

- E-democracy - the use of electronic communication to increase citizen participation in the public decision-making process.

- E-commerce – the electronic exchange of money and goods.

- E-management - the use of IT to improve the management of government.

The centre also predicts that the future of the e-government will hold five challenges: comprehensive strategy; integration of information and services; privacy and data sharing; dynamic use of the web; partnerships and other organisational networks.

To sum up, the need for e-government and its development will persist for the foreseeable future.

For more than two decades, the concept of e-government has been internationally recognised (Elbahnasawy 2014). Many countries in the developed world have adopted and implemented e-government portals where government services and communications can be delivered interactively to citizens (Elbahnasawy 2014). These e-government portals were developed independently so that each government has implemented its own particular structure and adopted their existing service through websites and built their e-government portals accordingly.

In this research, a unified e-government components framework is introduced. The unified approach is based on the United Nations classification, also known as the E-Government Development Index (EGDI), to evaluate the possibility of using unified e-government components across the globe. The EGDI ranks all countries throughout the world based on three categories, namely: Telecommunication Infrastructure Index (TII), Human Capital Index (HCI) and Online Services Index (OSI).

An in-depth analysis of six well-known and highly ranked e-government portals was conducted. An analytical methodological approach was used to compare common components and place each one under a suitable title selected from the sample portals. Component analysis was based on the existing literature. The unified approach focuses on the perceived usefulness and ease of use as the main criteria for assessing the e-government portals but permits individual governments to add or remove any component as they see fit to their particular needs (Orange et al. 2007).

The main aims and objectives of this unified approach are to use commonly accepted terminology that will be similar or the same in every country in order to ensure and engender trust among citizens when using such services, that is to say this approach will assist in achieving an internationally standardised approach to e-Government services.

4.2 *Theoretical Framework*

4.2.1. Standard and Quality

It has been found that there is a lack of standards of quality in e-government portals/websites where commonly accepted standards would help in accelerating the implementation of full online public service delivery (Hassan et al. 2010). This is supported by Sedek (2011) who claimed that there was a need to improve e-government websites/portals regarding quality, attributes and architecture type. There is a need for standardisation of e-government components regarding quality and management of information to secure the benefits of e-government (Li and Abdalla 2014). Bertot and Jaeger (2006) have argued that websites should be designed in a manner that can be accessed universally by citizens wherever they are.

Citizens' requirements are an important aim for both policy makers and service providers (Shareef et al. 2011). Therefore, governments should focus on fixing the e-government portals and fulfilling their citizens' needs based on the structure of the service. Also, online services should be easy to use and navigate, flexible and fully available (Shareef et al., 2011). Building trust and quality of services together with reducing security issues positively impact on citizens' satisfaction and perceived usefulness (PU) of e-government portals (Ahmed et al., 2015). While Ahmed et al. introduced security issues as being an important factor in attracting users to use e-services, this is beyond the remit of this study.

4.2.2. Portals and Architecture

E-government portals/websites adopt the following architecture standards which are well-known in the web design and Human-Computer Interaction disciplines (Shekhar and Xiong 2008):

- Services Oriented Architecture (SOA)
- E-Government Interoperability Framework (GIF)
- Enterprise Integration Application (EIA)
- Geography Mark-up Language (GML)

These schemes or standards allow the exchange of all types of data and information between computer systems. Each scheme can be better defined as a family of certain formats to share common elements (MacKenzie et al. 2006; Shekhar and Xiong 2008).

Government information plays a vital role in the development of countries. It is a citizen's basic right to receive relevant and up to date information. Furthermore, it is considered as a duty of government to ensure that relevant information is readily accessible to all citizens. That duty can be efficiently discharged by using electronic media to ensure that there is equality of access to information among citizens and to enhance government efficiency and effectiveness (Chander and Kush, 2012).

This study focuses on three perspectives: an academic literature review of e-government; UN E-Government Index Reports from 2001-2014; and actual e-government portals from the selected countries.

4.3 *UN E-Government Index Reports from 2001-2018*

The United Nations (UN) looked at e-government from different perspectives. The 2014 UN report on E-government Development Index, which is used as a starting point for this research, evaluates e-government readiness for each country based on certain measurement criteria (UN 2014). Using the UN report that is prepared by the Department of Economic and Social Affairs (UNDESA) every two years, the UN ranks the world's 193 member states using a relative scale that is based on an expert survey to assess the online presence through the existence of national websites. The assessment also includes e-government strategies and policies which are applied to public service delivery (UN 2014). The current study commenced in March 2016 at a time when the UN 2016 and 2018 reports were not yet ready for publication. For this reason, the 2014 report was selected as the main reference for this research, and it has later been extended to include the 2016 and 2018 reports (UN 2018).

The relative scale used by the UN is based on a mathematical model by which the E-government Development Index (EGDI) is calculated as an average of the normalised three scores based on the three most important dimensions. These dimensions are the scope and quality of e-government (the Online Services Index (OSI)), and the development status of telecommunication

infrastructure (the Telecommunication Infrastructure Index (TII)), and inherent human capital (the Human Capital Index (HCI)) (UN 2018).

4.3.1. Telecommunication Infrastructure Index – TII

This is the mathematical average of the following indicators: the estimated number of Internet users per 100 citizens; the number of main fixed telephone lines per 100 citizens; the number of mobile phone subscribers per 100 citizens; the number of wireless broadband subscriptions per 100 citizens; and the number of fixed broadband subscriptions per 100 citizens (UN 2018).

4.3.2. Human Capital Index – HCI

This is the mathematical average of the following four indicators: adult literacy, which is measured by the percentage of citizens aged 15 and above who can read and write with understanding; the gross enrolment ratio, which is the combined primary, secondary and tertiary gross enrolment ratio out of the total number of students enrolled in each level; the expected years of schooling – this is the total number of years of education that a student of a certain age can expect to receive in the future; and finally, the mean years of schooling – this is the average number of years of education completed by a specific country's adult population who are 25 years old and over (UN 2018).

4.3.3. Online Services Index – OSI

This focuses on the following six themes: whole-of-government – the integration of online service delivery; multichannel service delivery – using e-government to provide citizens with related information and services; bridging the digital divide – the role of e-infrastructure in bridging the digital divide and the provision of e-services to all citizens' categories including the disadvantaged, disabled, poor, women, children, and vulnerable groups; increasing usage and open data, which is related to the increase in the usage of services through open government data, e-procurement, and multichannel services delivery; and E-participation – this context is related to the expansion of mobile government and citizens involvement through e-participation (UN 2018).

The three UN classifications described above form the basis of the ranking procedure of EGDI and are the criteria used to rank each country. The scope of this research is on the e-government components, which are typically related to e-government integration - utilising all the infrastructure available, service availability and usage, citizens' participation and citizen-centricity. Therefore, the OSI category is the category that had to be followed in this research.

On the other hand, the above-mentioned background and the literature review revealed the importance and sensitivity of e-governance, especially considering the government institutions and agencies. For that reason, the inspiration came to conduct this study to think in a unified approach for

standardising e-government portals that contains all the necessary components, which could be offered worldwide as a general framework.

4.4 *Actual E-government Portals*

In this section, the main focus is on analysing the top selected real e-government portals based on the United Nations E-government Development Index report for the year 2014. Therefore, looking at the actual implemented e-government portals together with the experience in accessing these portals will create a good background in building the intended framework.

4.4.1. UN Ranks from 2001 - 2018

According to the United Nations assessment criteria for the years 2001- 2018, the countries, which have consistently been placed in the top ten for several years regarding e-Government implementation, are the USA, Australia, New Zealand, Singapore, Norway, Canada, UK, Netherlands, Denmark, Republic of Korea, France, and Germany (UN 2001; UN 2003; UN 2004; UN 2005; UN 2008; UN 2010; UN 2012; UN 2014; UN 2016; UN 2018). Some countries appeared once or twice in this period, for example Switzerland and Japan. No country has retained its position more than four continuous ranks. Therefore, the ten positions have been filled by these countries for more than a decade and a half. Bahrain is the highest ranking Arab developing country, reaching the ranks number 13 and 18 in the year 2010 and 2014 respectively. The following table shows the ranks 1 to 20 in the UN E-Government index report

from 2001 to 2018, with this study focusing on UN reports up to the 2018 report.

It is clear from table (4.1) that no one country can retain its rank forever, and the ranking of countries changes from time to time, for example the USA was able to keep its position on the top of the list from 2001 up to 2007 then it started going down to rank 4 in 2008 and reached rank 12 in 2016 and now in 2018 is in rank 11. While the Republic of Korea has increased from rank 15 in 2001 to rank 5 in 2004 and 2005 then kept the rank 1 for three continuous periods 2010, 2012, 2014 and in 2016 appeared in rank 3 and so on in 2018. On the other hand, the UK steadily moved upwards by nearly one level every year from 2001 up to reaching rank 3 in 2012, and sharply moved down to rank 8 in 2014, then moved up to rank 1 in 2016 and in 2018 moved down to rank 4.

Estonia is one of the European developing countries which entered the top 20 list at the beginning of 2003. Estonia's position has fluctuated between rank 13 and 20 in all UN e-government surveys since 2003. However, it has retained its place among the top 20 for more than a decade Germany (UN 2001; UN 2003; UN 2004; UN 2005; UN 2008; UN 2010; UN 2012; UN 2014; UN 2016; UN 2018).

Table 4-1 The first 20 countries on the UN Report about E-Government Index from 2001 to 2018

	2001	2003	2004	2005	2008	2010	2012	2014	2016	2018
1	USA	USA	USA	USA	Sweden	Republic of Korea	Republic of Korea	Republic of Korea	UK	Denmark
2	Australia	Sweden	Denmark	Denmark	Denmark	USA	Netherlands	Australia	Australia	Australia
3	New Zealand	Australia	UK	Sweden	Norway	Canada	UK	Singapore	Republic of Korea	Republic of Korea
4	Singapore	Denmark	Sweden	UK	USA	UK	Denmark	France	Singapore	UK
5	Norway	UK	Republic of Korea	Republic of Korea	Netherlands	Netherlands	USA	Netherlands	Finland	Sweden
6	Canada	Canada	Australia	Australia	Republic of Korea	Norway	France	Japan	Sweden	Finland
7	UK	Norway	Canada	Singapore	Canada	Denmark	Sweden	USA	Netherlands	Singapore
8	Netherlands	Switzerland	Singapore	Canada	Australia	Australia	Norway	UK	New Zealand	New Zealand
9	Denmark	Germany	Finland	Finland	France	Spain	Finland	New Zealand	Denmark	France
10	Germany	Finland	Norway	Norway	UK	France	Singapore	Finland	France	Japan
11	Sweden	Netherlands	Netherlands	Germany	Japan	Singapore	Canada	Canada	Japan	USA
12	Belgium	Singapore	Germany	Netherlands	Switzerland	Sweden	Australia	Spain	USA	Germany
13	Finland	Republic of Korea	New Zealand	New Zealand	Estonia	Bahrain	New Zealand	Norway	Estonia	Netherlands

14	France	New Zealand	Iceland	Japan	Luxembourg	New Zealand	Liechtenstein	Sweden	Canada	Norway
15	Republic of Korea	Iceland	Switzerland	Iceland	Finland	Germany	Switzerland	Estonia	Germany	Switzerland
16	Spain	Estonia	Belgium	Austria	Austria	Belgium	Israel	Denmark	Austria	Estonia
17	Israel	Ireland	Austria	Switzerland	Israel	Japan	Germany	Israel	Spain	Spain
18	Brazil	Japan	Japan	Belgium	New Zealand	Switzerland	Japan	Bahrain	Norway	Luxembourg
19	Italy	France	Ireland	Estonia	Ireland	Finland	Luxembourg	Iceland	Belgium	Iceland
20	Luxembourg	Italy	Estonia	Ireland	Spain	Estonia	Estonia	Austria	Israel	Austria

4.4.1 Selected Materials and Methods

Table 4.2 illustrates the selected e-government portals, which have been considered and taken as a starting point for this research where the thematic analysis and in-depth comparison has been conducted.

Table 4-2 E-government Portals URL

UN-2014	Rank	URL of the Portal	Country
1	1	http://www.korea.net/	**Republic of Korea** E-Government portal.
2	2	http://www.australia.gov.au/	**Australian** E-Government portal.
3	7	https://www.usa.gov/	**USA** E-Government's official web portal.
4	8	https://www.gov.uk	**UK** E-Government portal.
5	15	http://e-estonia.com	**Estonian** E-Government portal.
6	18	https://www.bahrain.bh/	**Bahrain** E-government portal.
UN-2016	**Rank**	**URL of the Portal**	**Country**
1	1	https://www.gov.uk	**UK** E-Government portal.
2	2	http://www.australia.gov.au/	**Australian** E-Government portal.
3	3	http://www.korea.net/	**Republic of Korea** E-Government portal.
4	12	https://www.usa.gov/	**USA** E-Government's official web portal.
5	13	http://e-estonia.com	**Estonian** E-Government portal.
UN-2018	**Rank**	**URL of the Portal**	**Country**
1	2	http://www.australia.gov.au/	**Australian** E-Government portal.
2	3	http://www.korea.net/	**Republic of Korea** E-Government portal.
3	4	https://www.gov.uk	**UK** E-Government portal.
4	11	https://www.usa.gov/	**USA** E-Government's official web portal.
5	16	http://e-estonia.com	**Estonian** E-Government portal.

These e-government portals were taken as a case study and analysed qualitatively by using the common component names which were put on the portals and delivered by the corresponding governments. These portals were initially placed in six tables then an in-depth analysis was performed on each component and compared with the corresponding component for each e-government portal. The process was done manually, and the focus was on the lexical and word-by-word analysis for the common names and their meanings which were generally attributed to the six portals. Conceptual similarities across the six e-government portals components were used to formulate that illustrates the result of the analysis and collated those components which were in common and agreed upon within the six portal. Countries also offer several services which are not standard and considered to be anomalies. These components which specifically relate to a certain country or group of countries, can be added to category number 17 in the proposed list of the unified services illustrated below. A limited life services component was added to the seventh table as a result of the findings of certain services and events in each country's portal which were applicable only to that specific country and lasted for only a short period.

New components were initiated based on the sub components found scattered within different main components in different portals. These components were unified under new names to create a common meaning and activities. As an example, the new components were called 'Culture, Religions and Social norms,' which could include all of those subcomponents related to the cultural

and religious aspects found as part of other components in those e-government portals.

4.5 *Selection Justification*

The reasons behind taking these e-government portals were as follows: firstly, the study was conducted in the United Kingdom (UK), and the researchers were using the portal and were familiar with some of the services delivered by the UK Government portal. Secondly, the UK is one of the leading countries in the electronic services and is ranked among the top 10 in the United Nation e-government report (UN 2014). Thirdly, the portal is seen as well-established and contains most of the e-government components which are needed by the citizens.

The Republic of Korea's e-government portal was chosen as it is ranked as the first in the United Nations e-government report and also it is ranked as the first country among Asian developed counties (UN 2014).

The Australian e-government portal was chosen as it is ranked as the second in the United Nations e-government report and also it is ranked as the first country in the Oceania region (UN 2014).

The United States of America (USA) government portal is taken from the other side of the world, and it is the leading developed country and considered as the role model for the corresponding developed countries economically and politically. Furthermore, it is ranked as the first country in both Americas regions (UN 2014).

Estonia has been chosen because it is one of the developing European countries and has established itself successfully as one of the best e-government portals among the regional countries and ranked in position 15 (UN 2014). Also, Estonia has retained its place in the first 20 worldwide since 2003 in the United Nations reports.

Lastly among the Arab countries' region, Bahrain has been chosen for the following reasons: first of all, it is the highest ranked among the Arab countries. Second, Bahrain is the only Arab country which entered the top 20 list worldwide in two years, where it reached rank 13 in 2010 and rank 18 in 2014 (UN 2010; UN 2012). Thirdly, it is one of the Asian developing countries which has successfully established one of the best e-government portals among the regional countries where it ranked as 18 in the same UN E-government survey. Fourthly, the State of Bahrain jumped to the top at a rate of 18 points in two years and this is the highest rate of change in the region (UN 2014).

In addition to those reasons, the United Nations e-government Development Index Report has been taken into consideration and the varieties in the type of services delivered, culture, and population size are also considered in the selection criteria.

4.6 *Findings and discussion*

Based on the analysis of those six portals, it can be said that the common components are merged based on the meaning of each component and related sub-components, which the same meaning in the services delivery

context. As an example, components entitled “Benefits, Grants, Loans and Payment” have been joined together in this context as it represents the efforts made by any government in the world to control all types of payments to avoid fraud (Dixon 2010; Wendy Morton-Huddleston Cgfm and Pmp 2014). This component consists of all the subcomponents, which are related to any of the words included in the component name and the merging of previously compartmentalised components. Table 4.3 illustrates each merged component name and from which portals that component has been taken.

Table 4-3 Merged components corresponding to original portals components

Original Component Name	Merged Component Name
Benefits (UK, 2016)**; Benefits, Grants and Loans** (USA, 2016)**; Benefits and Payments** (Australia, 2016)**; Services and Benefits** (Estonia, 2016)**.**	Benefits, Grants, Loans and Payment
Education And Learning (UK, 2016)**; Education** (Estonia, 2016; USA, 2016)**; Education and Training** (Australia, 2016)**; Education, Research and Industry** (Korea, 2016)**; Educational** (Bahrain, 2016)**;**	Education, learning, training and Research
Healthcare (Estonia, 2016; UK, 2016)**; Health Safety and Environment** (Bahrain, 2016)**; Health** (Australia 2016; USA 2016)**;**	Healthcare

Housing and Local Services (UK, 2016)**; Housing and Community** (USA, 2016)**; Housing, property and community welfare** (Bahrain, 2016)**; Housing** (Australia, 2016; Korea, 2016)**; Social Welfare e-services** (Estonia, 2016)	Housing, property, community welfare and Local Services
Working, jobs, Employing people and pension (UK, 2016)**; Jobs and Unemployment** (USA, 2016)**; Jobs and Work Place** (Australia, 2016); **Labour and Social welfare system** (Korea, 2016); **Employment** (Bahrain, 2016)**;**	Working, Jobs, workplace, unemployment and pensions
Money and Tax (Australia, 2016; UK, 2016)**; Money and Shopping** (USA, 2016)**; Financial Support** (Bahrain, 2016)**; Money** (Bahrain, 2016; Korea, 2016)**; Shopping** (Korea, 2016)**; Tax** (Korea, 2016)**; Financial Services** (Estonia, 2016)	Money, Tax, Shopping, and Financial Services and Support
Passport, travel and living abroad (UK, 2016)**; visas and immigration** (UK, 2016)**; travel and immigration** (USA, 2016)**; travel** (Korea, 2016)**; immigration and visas** (Australia, 2016)**; passport and travel** (Australia, 2016)**; tourism and events** (Bahrain, 2016)**; Passport** (Estonia, 2016)**; personal documents** (Bahrain, 2016)**;**	Visas, Immigration, Passport, Travel, Tourism, Personal documents and living abroad
Environment and Countryside (UK, 2016)**; Earth and Environment** (USA, 2016)**; Infrastructure**	

(Estonia, 2016)**; Utilities and Infrastructure** (Bahrain, 2016)**; Environment** (Australia, 2016)**; Utilities** (Estonia, 2016)**.**	Environment, countryside, Earth, Utilities and Infrastructure
Crime, justice and law (UK, 2016)**; laws and legal issues** (USA, 2016)**; Public Safety** (Estonia, 2016)**; Public Safety and Law** (Australia, 2016)**; Laws** (Korea, 2016); **legislation and courts** (Bahrain, 2016)**;**	Crime, Justice, Law, Public Safety, Court and Legal Issues
Birth, Death, Marriages and Care (UK, 2016)**; Marriage** (Korea, 2016)**; Birth, Death, Marriage and Divorce records** (USA, 2016)**; Birth Certificate** (Bahrain, 2016)**; Family and Community** (Australia, 2016)**;**	Birth, Death, Marriages, Divorce, Care and Family
Business and Self-employed (UK, 2016)**; Business** (Estonia, 2016; Korea, 2016; USA, 2016)**; Business and Industry** (Australia, 2016)**; Business and Trade** (Bahrain, 2016)**;**	Business, Trade, Industry and Self-Employed
Driving and Transport (UK, 2016)**; Transport and Regional** (Australia, 2016)**; Transport and Traffic** (Bahrain, 2016)**; Driving** (USA, 2016)**; X-Road** (Estonia, 2016)**;**	Driving, Transport, Traffic and Regional
Citizenship and living in the Country (UK, 2016)**; e-residency** (Estonia, 2016)**; Citizens** (Estonia, 2016)**;**	Citizenship, Society and Living in the Country

Society (Korea, 2016)**; Citizenship** (USA 2016; Bahrain 2016)	
Military and Veterans (USA, 2016)**; Security and Defense** (Australia, 2016)**; Military Recruitment, Training, and Operation**(UK, 2016)**; Military** (Korea, 2016)	Military, Veterans, Security and Defence
Governments (Bahrain, 2016; Estonia, 2016; Korea, 2016; UK, 2016; USA, 2016)**; A-Z of government services** (Australia, 2016)**;**	Government Services
(Australia, 2016; Bahrain, 2016; Estonia, 2016; Korea, 2016; UK, 2016; USA, 2016)	Religion, Culture, History, and Social Affairs
(Australia, 2016; Bahrain, 2016; Estonia, 2016; Korea, 2016; UK, 2016; USA, 2016)	Limited Life Services and Emergencies

The same method of merging and building the related components together has been followed for the rest of the components and subcomponents. All the contents of the six portals were visited and thoroughly pattern matched and compared with each other to unify the meaning of every single component. Some components remained unaltered while others have been merged because the services meanings were similar. The new table, which contains the merged components, is illustrated see Appendix C.

Two new components called; “Limited Life services and Emergencies” and “Religion, Culture, Historical events and Social affairs” are proposed because of their scattered subcomponents over other unrelated ones in each portal. Some portals include short-term services and non-generalisable events or services; therefore, the researchers suggest collecting all related subcomponents together under proposed component names.

The proposed unified framework of e-government can be taken forward and utilised as a framework of best practices and guidance when initiating e-government portals in developing or undeveloped countries. Also, the ease of using a standard portal will positively impact on citizens’ satisfaction (Al-Hawary and Al-Menhaly 2017), where they will feel secure when using the unified portals all over the world.

The proposed list of the unified services can be summarised as:

- Benefits, Grants, Loans and Payment
- Education, learning, training and Research
- Healthcare
- Housing, property, community welfare and Local Services
- Working, Jobs, workplace, unemployment and pensions
- Money, Tax, Shopping, and Financial Services and Support
- Visas, Immigration, Passport, Travel, Tourism, Personal documents and living abroad
- Environment, countryside, Earth, Utilities and Infrastructure

- Crime, Justice, Law, Public Safety, Court and Legal Issues
- Birth, Death, Marriages, Divorce, Care and Family
- Business, Trade, Industry and Self-Employed
- Driving, Transport, Traffic and Regional
- Citizenship, Society and Living in the Country
- Military, Veterans, Security and Defence
- Government Services
- Religion, Culture, History, and Social Affairs
- Limited Life Services and Emergencies

4.7 *Summary*

The proposed unified approach came about as a result of the confusion that confronts the portal users when they are looking for the specific information where they had become accustomed to finding it in specific places in other portals (Gugliotta et al. 2005; Darem 2013). This study proposes a new unified structure of e-Government components, which is based on an analysis of six of the most advanced e-government portals across different international regions. A comparison of existing components and subcomponents from the six e-government portals was also used as input to finalise the proposed unified structure. It has been noted that component names are based on each country's unique interpretation according to their individual or collaborative perspectives. In line with the United Nations' vision and mission, the proposed approach can help in sharing best practices and unify the efforts and benefits among the 193 United Nations states.

Usability and accessibility are considered as the practical benefits of this unified e-government approach aiming to help in globalising common online government services. Citizens in developed, developing and the least developed countries share the same living environment and are in need of the same type of services from their governments. The proposed unified approach developed as a response to the confusion that faces the portal users when they are looking for specific information where they had become accustomed to finding it in specific places on other portals (Gugliotta et al. 2005; Darem 2013). This framework can be considered as a starting point for the United Nations to share as a guide for governments before building and initiating their electronic service portals. It will also help the UN to evaluate the readiness of the online services more easily and accurately.

Although the proposed framework is a collection of components of high-performance e-government portals worldwide, it is expected that certain components in individual countries may be difficult to classify. However, there is always room for enhancement, and further studies are still required for the improvement of online service provision to citizens worldwide.

Chapter 5: The Impact of Unified Approach of e-Services; Analysis and Findings

5.1 *Introduction*

This chapter aims to explore the role of the impact of unified approach of e-services on the government cloud in Oman's public sector institutions. A mixed methods approach was considered appropriate to address this objective (see chapter 3). This chapter presents the results of the first phase of mixed methods, which was of a qualitative nature. Semi-structured interviews were conducted and data analysis and key findings from this analysis are presented in this chapter. The interviews were designed to answer the research questions.

The questions were addressed by mixed methods because the questions were exploratory. The results of the qualitative phase are presented in-depth from the perspective of each of the research questions. The study was based on a thematic analytical approach and the main findings were presented as topics and sub-themes. A broader scope will be provided in Chapter 7, where a quantitative approach has been adopted to explore the extent to which these and sub-topics are found in a broader survey.

Twenty-one interviews were conducted between September 2017 and January 2018 with staff from several public sector institutions in the Sultanate of Oman. The twenty-one participants were selected from the management

and operational levels of the institutions. The aim was to consult with all key actors in the unified approach of e-services on the government cloud and included different views of senior and middle management as well as those of staff at the operational level (see chapter 3, item 3.5.1.1, "*Selection of Participants*").

5.2 *Unified e-government services in cloud and user acceptance*

5.2.1. The impact of unified e-government services in cloud

E-Government is a portal providing easy access to all necessary data, information, services and documents by government institutions. The Sultanate of Oman has taken the initiative to adopt e-government services, making every effort to provide the best services through available websites In the case of the Sultanate of Oman, there is still no academic survey conducted to identify the various factors that impede the adoption of e-government services. Consolidated e-Government services can be evaluated through behavioural intention to accept the use of e-Government services.

Kundra (2011) states that duplication of systems and services will lead to high demand for IT infrastructure resources as well as data and information storage space. In addition, Metheny (2017) confirmed to what Kundra stated. However, Chandrasekaran & Kapoor (2011)argues that the creation of a shared cloud services platform will have the potential for collaboration between different institutions, which will enhance co-production capacity due to the sharing of information and expertise among them. Always frequent systems and services

waste time to choose the services and disprsion of the user to choose the service. These disadvantages, which are directly, related to users 'participation in e-government services will have an unpleasant impact on users' minds (Abeywickrama and Rosca 2015). As such, it is necessary to have a unified system and e-government services to disseminate reliable and quality information to its users, if this platform can get rid of repeated services. Thus, cloud computing facilitates the management of the vast amount of services in Oman. Users can terminate a reliable, secure and more convenient service.

Yeh et al. (2010) has also pointed out that some e-government systems and services are not integrated. However, the use of cloud computing for e-government services will help in working together which will greatly improve stability. In terms of security, most e-government data centres lack a unified security mechanism, causing limited security and confidentiality of services. However, the use of cloud computing with the integration of e-government services to the establishment and management of security mechanisms in government institutions.

It is necessary to promote more comprehensive and closer cooperation between the governments of the world to develop uniform global rules and guidelines for safer government management. The government cloud will reform the state administration, enhance the efficiency of government work, improve public services and bring more benefits to both users and the government to solve the difficulties faced by e-government (Liang 2012).

Whereas, the adoption of a unified framework for public services using cloud computing will promote the transformational changes needed for the future of public services to reform legacy services and the organisational dimensions of websites (Alonso et al. 2016). Using a unified framework, trust can also be assessed by leveraging the trust and reputation systems of cloud computing providers and thus trends lack a unified approach to support consumers in evaluating providers and choosing the most trustworthy approaches (Habib et al. 2012).

Cloud services allow access to e-government services at any time via the Internet. Thus, these services have the potential to improve the relationship between government, institutions and citizens by providing service integration and simplifying procedures for enhanced e-participation. The government cloud helps to further solve the digital divide by promoting rapid access to e-government services (Haag et al. 2014).

A study in Ethiopia (Gebreselassie 2016) indicates the existence of a public-private partnership to provide better public infrastructure and services. The study was in the unified billing system to assess the state of public-private partnership in the region which 375 respondents were selected from the survey and four officials were interviewed. The results of the study indicated that the unified billing system is effective for the entities and has a positive impact on the field of providing services to customers. Public sectors have been motivated to merge private companies and start working with them by improving the poor services provided to the public information service, the

unified billing system is a single central network used to pay all utility bills by combining payments in one window.

5.2.2. User Acceptance

There is no uniform definition of acceptance in the previous literature except the one by Lallmahomed et al. (2017) that asserts IT acceptance refers to the study of factors that make an individual accept or reject technology, factors that will improve an individual's uptake of technology and factors that predict the future utilisation of technology. Shareef et al. (2011) assert that the success of e-government services depends on the adoption of these services.

This research focuses on the user's acceptance of using e-government services through the behavioural intention of individuals as a dependent variable in measuring the success of the implementation of the IT system. Each of these flows contributes significantly to the literature on user acceptance of information technology (Venkatesh et al. 2003).

Analyses in previous literature have indicated that UTAUT is the best model available based on all criteria for accepting the use of e-government services in terms of the importance of relationships and their overall performance. As well as this model trend clearly indicates the performance of the independent variable and mediator in terms of the importance of relations between the structures and indicators and the variation shown on the behavioural intention. The research also acknowledge that the formulations (performance expectancy, effort expectancy, social influence, and facilitating conditions) of

the original UTAUT model (Venkatesh et al. 2003) contain the majority of combinations used in previous dominant technology adoption models that relate to the similar meaning of their structures.

Similar to the choice of UTAUT2, Venkatesh (2003) draws conclusions from previous researches on the individual acceptance of the IS / IT system used in e-government services studies in a unique theoretical e-government adoption model that captures the key elements of predefined models. Firstly, theoretical references identify nine models of determinants of intention and use. Secondly, conceptual and empirical similarities across these models and the process of formulating the UTAUT2 model were used to develop the research model. The factors collected were carefully selected based on their performance and collected from the interviews. The researcher presented the research model, which imposes direct determinants (security, confidence, expected effort, expected performance, social impact, facilitating conditions, quality, and cost value) of behavioural intention, two direct determinants (design and content) of quality, and a direct determinant of expectation of effort (ease of use) and a direct specifier to predict performance (content). As for the effectiveness of the unified approach to e-government services, there were direct determinants (security, trust, social impact, facilitating conditions, quality, and cost value, ease of use, design and content) of behavioural intention. Through this research model, we found that behavioural intention played a strong role in mediating the study of acceptance of the use of e-government services. The results of this research are crucial in the fact that

they emphasise the importance of public modelling of individual characteristics through the proposed research model.

The proposed framework has showed an improved use of services by citizens (behavioural intention) of 67%. The increment was 12% from the non-unified e-government services. Therefore, the researcher argues that interest and positiveness would directly affect the individual to use unified e-government services on cloud.

In India, the aim of the study was to develop a standardised model for adopting and validating the e-government system using data collected from 419 citizens from different cities. The research was evaluated from the performance of nine known alternative theories of critical models for IT adoption, including standard acceptance theory and the use of technology. The results indicate that the proposed standard model for the adoption of the government throughout the research conducted any of the other models of interest in behavioural intention, which indicates the level of acceptance of a significant relationship between each hypothesis (Rana et al. 2016).

Another study in India was about slow adoption of emerging e-government applications (e-Gov) remains a problem in developed and developing countries. This research examined nine alternative theoretical models for technology adoption in the context of e-Gov using data collected from citizens from four selected districts of Bihar, India. Analysis of models indicates that their performance does not reach the expected level of efficiencies, variations in behavioural intention, or appropriate indicators of models. In the convergent

response to visual theoretical models to explain the adoption of e-Gov, Rana et al. (2017) developed and tested a standardised model for e-government adoption using the same data. The results suggest that the proposed research model outperforms all alternative models of technology adoption with behavioural intention, with acceptable values for appropriate indicators and significant relationships between each pair of assumed factors (Rana et al. 2017).

5.3 *Interview Data Analysis*

The analysis of the interview data follows the steps developed by Braun and Clarke (2006) for thematic analysis, where they developed a more systematic methodology for understanding interview analysis data to understand this analytical method and suggested the following steps for analysis (see Chapter 3, Section 3.6.2):

1. Familiarisation with interview data
2. Generation of initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

Step1: Familiarising yourself with your data

Data is organised and set up for analysis by producing written transcripts for each interview. It is very important in thematic analysis to become familiar with

the data. Therefore, the researcher, with prior and general knowledge, collected the data. Each interview took approximately three to four days to record, transcribe, and then translate from Arabic to English. After that, the transcripts were laid aside for two weeks before the researcher became immersed in the data for a greater understanding of the contents of the interview data (Braun and Clarke 2006; W Creswell 2016).

Moreover, Bryman (2016) points out that it is worth giving the average copying time of transcribing for each hour of speech around five to six hours. However, Braun and Clarke (2006: 88) argue that:

> "the time spent in transcription is not wasted, as it informs the early stages of analysis, and you will develop a far more thorough understanding of your data through having transcribed it."

Step2: Generating initial codes

The QSR NVivo 11 software package was used to analyse transcripts interviews, 193 initial codes were created. According to Bell (2014: 221) "Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study". Bell (2014: 222) also states that "coding allows you to cluster key issues in your data and allows you to take steps towards drawing conclusions." Flick (2018) states that a multi-phase procedure is used for a thematic coding. The researcher produces a preliminary list of symbols created by reading the data. The coding was done by finding patterns in the raw data and was freely selected even using cams (Foss and Waters 2003). This coded data was used in later stages to create

topics. The researcher generated many codes as any of them may become important at a later stage. In fact, many authors recommend keeping primary codes as wide and open as possible at this stage, and later reducing the number of symbols once a whole set of symbols is absorbed by the researcher (Braun and Clarke 2006; W Creswell 2016). For example, the lack of specialized and technical training was maintained at this initial stage, but was later dropped as the key issues involved were integrated into other key themes. This was to ensure that no important insights were lost.

Step 3: Searching for themes

Thematic analysis depends on patterns of data and subjects collected through the interviews. Braun and Clarke (2006: 82) define a theme as "something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set." The researcher used the coding process to generate an explanation of topics (W Creswell 2016). To assist the researcher in this part of the analysis, the concept map for each transcript was used to organise, link and merge the initial codes and generate the main subjects to produce an overview of all the transcript data (see sample layout in figure 5.1). The topics from these initial codes were identified resulting in 90 cross-cutting themes; these are called nodes in the NVivo software. These nodes were identified by the researcher during the analysis of the initial 193 symbols to discover their common denominators and thus reduced the number of symbols from 193 to 90 comprehensive themes.

Step 4: Reviewing themes

In this step, all nodes results were reviewed to verify that they were installed together and that there were no unnecessary overlapping nodes. This review allowed the researcher to further reduce these nodes by organising them into different categories of themes (the main themes) and each category with its own sub-themes that were linked to each other. This was necessary in order to reduce the large number of themes to enable the research to deliver results in a comprehensive and coherent manner (Braun and Clarke 2006).

Step 5: Defining and naming themes

During these steps, all themes and subthemes were named and marked as represented and reflected. All these themes were then grouped into 9 main themes.

Step 6: Producing the report

As the last step, this procedure is to present the results of the analysis. Therefore, the full findings of the analysis of semi-structured interviews are reported in this chapter.

Table 5.1 below shows how each participant was coded before analysing the interview data to protect participants' identity and maintain confidentiality (see Chapter 3, Section 3.8).

Table 5-1 Codebook with the particular details of the interviewees

No.	Gender	Interviewee Code	Interviewee Position	Organisation Code
1	Female	M1	Head of Programming and Software development Section	Institution A
2	Male	M2	Head of Programming and Software development Section	Institution B
3	Male	M3	Head Section of Programming and Systems Development Section	Institution C
4	Female	M4	Acting head of IT systems management department	Institution D
5	Male	T1	Director General of Information Technology	Institution E
6	Male	O1	Software Development Specialist	Institution F
7	Male	M5	Head of Internet Applications Section	Institution G
8	Male	O2	Software Development Specialist	Institution H
9	Male	M6	Deputy Director of Information Technology	Institution I

10	Male	T2	Director General of Information Technology	
11	Male	M7	Assistant director of Information Technology	Institution J
12	Female	O3	Expensive of analysis and programming	
13	Male	T3	Director of e-government transformation	Institution K
14	Male	M8	Website admin – Team leader portal, mobile application and system development	Institution L
15	Male	M9	Web Admin	Institution M
16	Male	M10	Assistant Director of IT Department	Institution N
17	Female	M11	Head department of Systems Design and development	
18	Male	O4	Programmer	Institution O
19	Female	M12	Programmer and web admin	
20	Female	M13	Head of Ministerial Committees Section	Institution P
21	Male	M14	Director of IT Department	Institution Q

Table Key:

T = Top management

M = Middle management

O = Operational level

* Each participant at any of these levels is farther identified by a digit e.g. T3 indicates the third top management participant.

5.4 *Main emergent themes*

The complete data analysis revealed that the entire data could be viewed comprehensively in 9 different features, each with a number of sub-themes. The researchers put these themes and sub-themes as the main issues that were considered important in the literature review although they emerged freely from analysis. In other words, the literature provided the researcher with a useful organisational framework for presenting the results. However, this scheme was not motivated primarily by literature. The researcher was keen to ensure that the final subjects appeared in the data and that the literature provided a framework for naming and organising the results.

5.4.1. Readiness of institutions to improve e-government services

5.4.1.1. Availability of infrastructure

The interviews repeatedly reported on the importance of the willingness of government institutions to improve their electronic services similar to the developed countries. T1 (Director General of Information Technology

Development) discussed what makes the developed countries maintain their ranking at the top ranks of the UNs report, in particular several factors such as transparency, community participation in decision making, availability of open data, multiple channels of concern with the service, commitment and infrastructure. He thought the problems of e-government are the lack of infrastructure and he looked forward to any of the government projects from four perspectives: infrastructure, processes followed to finish the project, business policy, technology used. In addition, M8 (Website admin, team leader portal, mobile application and system development) said:

> "All systems rely on G-Cloud to take a high risk of failure if there is poor network infrastructure or poor network management" (M8, Institution L).

T2 (Director General of Information Technology Development) added that:

> "Infrastructure is an important factor in determining the encouraged g-cloud for government services to avoid any pressure on the network in peak times. If the government has a good infrastructure and appropriate speeds are available on the lines, this will help to develop and improve e-services in government institutions" (T2, Institution I).

This means that the use of e-government services is lacking in most public institutions because of infrastructure. This was supported by M8, a software development specialist who blamed the weak network infrastructure and weak network lines management. In fact, the Director General of Information Technology Development T1, acknowledged this problem because there is no

infrastructure in place to serve all institutions, which resulted from the neglect of some important aspects of implementation and delay:

> “We look forward to any of the government projects from four perspectives: infrastructure processes followed to finish the project, business policy, and technology used “(T1, Institution E).

It is clear that priority has been given to technological issues to the neglect of people, processes and policies. This included neglecting the impact of a unified approach to e-services government. Other neglected issues that emerged from the interview data included the availability of resources and infrastructure, the availability of a realistic budget and data security, all of which would help the e- services to be ready for change to the government cloud. This will be presented in the next section.

The Head of Programming and Software development section stated that the infrastructure was not sufficiently developed to integrate all e-services because of the limited budget:

> "The e-government project is not implemented at the enterprise level but at the level of the service itself and the re-engineering of the procedures, where the electronic service is complete and there is no human intervention in terms of time and space, the infrastructure is very necessary for the integration and availability of e-government services to all segments of society" (M1, Institution A).

Another employee of the Institution (J) confirmed this point, saying:

> "I think that the greatest challenge faced in many institutions is the problem of infrastructure as hardware and software is somewhat outdated" (O3, Institution J).

Moreover, in some other institutions, they had an effective infrastructure but encountered network problems. For example, the head of the Ministerial Committees' section said that outside the capital, networks were very weak in some places:

> "We have one of the best infrastructures in our institution compared to others, but the problem is that telecom networks are not supported in some areas outside the capital to implement the government outside the capital, networks are very weak in some places and users are suffering from this issue" (M13, Institution P).

On other hand, other participants (M10, O4 and M12) stated that they had good infrastructure in their institutions:

> "The things that help us are that we started early in the implementation of the government cloud and we have good infrastructure at this stage" (M9, Institution M).

> "Implementation of infrastructure and budget support should be paid attention by the top management of this service where the top management sets an appropriate budget for the implementation of e-government services" (M11, Institution N).

5.4.1.2. Budget

T1 said that unifying the e-services on the government cloud would help to reduce the financial costs in institutions, as finance is one of the challenges facing the institution.

While M1 argued that:

> “budgeting is appropriate for institutions as long as each ministry executes this project in Oman separately" (M1, Institution A),

indicating that budgets are often insufficient to make institutions ready for implementation. This was also reflected in the comments of the head of networks and technical support, who noted:

> "The most important thing before any decision is made to implement any system is the availability of the budget because many projects to implement our digital systems were stopped due to budget issues” (T3, Institution K).

This suggests that some managers feel that budgets are often insufficient to cover the real cost of implementing some projects for data manipulation, software and warehousing. Therefore, some consider the government cloud to be important to help reduce financial costs in light of current economic conditions. However, other participants believe that the budget was adequate, as one head section (M11) indicated that their institution had sufficient budget to implement a government service.

> "Implementation of infrastructure and budget support should be paid attention by the senior management of this service where the senior management sets an appropriate budget for the implementation of e-government services" (M11, Institution N).

5.4.2. Acceptance of using e-government services

Acceptance is one of the main categories that emerged from the analysis of interviews. According to the data analysis, there was a consensus that staff acceptance and willingness to use electronic services were very important factors for successful implementation. Fortunately, the Acting head of IT systems management department M4 (Institution D) said:

> “Unifying the methodology of e-government services will positively affect the acceptance and increase the number of users because of the confidence acquired by the countries that that follow the classification of United Nations standards for e-government” (M4, Institution D).

On other hand:

> “Accessibility addresses discriminatory aspects related to equivalent user experience for people with disabilities, including people with age-related impairments. For the web, accessibility means that people with disabilities can perceive, understand, navigate, and interact with websites and tools, and that they can contribute equally without barriers” (M8, institution L).

5.4.2.1. Top management acceptance

A meeting was held between senior managers towards the modification of some electronic services and the managers of the departments considered this meeting a decisive factor in the development and improvement of the integration of some services:

> "One of the things that helps us improve e-government services is to take top management into society's minds" (M2, institution B).

M11 stated:

> “There is info mail for any complaints or suggestions and there is a box but it has not been activated because the top management did not give any person to follow this box”.

In addition, M11 said:

> “Implementation of infrastructure and budget support should be paid attention by the senior management of this service where the senior management sets an appropriate budget for the implementation of e-government services” (M11, institution N).

Senior management felt strongly that budgets were a key factor in successful improvement. Therefore, public administration tends to accept the changes involved in the continuous development of e-government services. Moreover, it turned out that this is the direction of the Cabinet as mentioned by some participants.

"The Council of Ministers directed all public sector institutions to start the implementation of e-government and transfer all its services onto the Internet" (O3, institution J).

5.4.2.2. Middle management acceptance

In general, most middle managers working in IT departments were supportive of taking the views of e-service providers. However, these middle managers pointed out that middle management in other departments, such as financial management, human resources and transport departments, tend to be resistant and reluctant to use e-services:

"We found that the level of senior management and staff were enthusiastic about changes that would add acceptance to electronic services but the level of middle management did not accept this type of change" (T2, institution D).

"Some middle managers do not have the time to implement and reduce some of the procedures, or to reengineer procedures to develop a new structure suitable for all users" (O2, institution H).

5.4.2.3. Operational level acceptance

Several issues around acceptance were found at the operational level: fear of making mistakes, complacency about the system and distrust. The results of each of these issues are presented in this section.

The fear of making mistakes was often found among older employees who had previously worked in the introduction of the government. Their behaviour reflected a culture of fear of making mistakes because of their lack of knowledge of new technology:

> "There are some older employees in public sector institutions who prefer not to deal with new hardware because they are afraid of making mistakes or mistakes" (O3, institution J).

> "The knowledge and qualifications of most older employees do not support them to use new technology (M3, Institution C).

The head of section of programming and system development (M3) provided an example of this resistance, where he said that some employees do not want to develop some services or the e-mail system. They preferred to use paper, as they were more familiar with it.

Moreover, others stated that they were afraid to lose their jobs. This was stated earlier (O4).

> "These employees are afraid of losing their jobs because they believe that e-government intends to reduce the number of employees" (O4, the first Institution).

However, to overcome this type of resistance, a top manager (T2) suggested forcing these employees to commit to accepting new electronic systems;

> "We have solutions to such issues because we have faced these issues from 2005, we get approval for those projects from the minister or the undersecretary, and then those middle managers or staff resist the use of the system "(T2, Institution I).

Some institutions in Oman still refuse any electronic transactions and insist on using paper. A manager provided an example:

This has helped to slowly re-engineer the e-services and generate trust in new electronic systems among employees:

"If you look at employees of youth organisations such as the Ministry of Higher Education or the Public Authority for Consumer Protection, they have new employees who have new trends in technology that help in the culture of improving and developing e-government services" (T2, Institution I).

In short, different levels within government institutions show different types of issues regarding the acceptance of the use of new technology and e-government services, and often reflect different aspects of user acceptance of these services. Senior management generally do not have any admissions issues. In the case of middle management, there was a reluctance of some departmental directors to engineer these procedures and translate them into the website. Moreover, middle managers tend to prevent consensus to end these actions, which they see as a threat to their authority and the persistence of certain services. At the operational staff level, there has often been

resistance among staff who have become proficient in using existing systems accurately.

5.4.3. Security of data

Data security is found to be an important issue in e-government services on the cloud, especially in those institutions where data security is a critical issue for all users. A number of respondents drew attention to this, one of the programmers and web admin staff said of a common e-platform for e-government services on the government cloud:

> "We encourage, but we are afraid of security, when safety is found, then the security is fine" (M12, Institution O).

In addition, the Head of Internet Application section confirmed the issues of security to some extent. In addition, T1 said if institutions increase security protection, this would increase the number of users of e-government services. T3 stated:

> "The greatest challenge of government agencies are policies and security, and security is needed for all users to be confident" (T3, Institution K).

In addition, M5 confirmed that:

> "To some extent because of security, the electronic authentication is applied by entering the civil card or mobile phone" (M5, Institution G).

M8 added that:

> “Each government also has its security and privacy; again, having one approach should be flexible to fit different cases and situations” (M8, Institution L).

> "Some parts of the project cannot be granted to a third party for security, so the staff of the IT directorate do it internally" (M1, Institution A).

In some institutions where data security addressed sensitive or confidential issues, middle managers did not have decision-making powers in relation to e-government. This was a top management function and was often seen as an obstacle to implementation:

> "The top management level in this institution interferes in the implementation of e-government services, and especially if this touches the security of information within the institution, we have to raise it to the top management" (M11, Institution N).

However, some interviewees took the opposite view and felt that the e-government would effectively support and strengthen data security:

> "E-government can secure information better than traditional methods, and many problems, such as missing files, can be avoided" (M4, Institution D).

In addition, several managers stated that some institutions had published certain rules for the protection of information security through the

implementation of e-government. An example of these rules is one requiring employee working in the IT department to examine security every two years. In addition, employees in some institutions were not allowed to take their mobile phones or memory devices into their institutions. In addition, USB ports were disabled on the system and could not be used. In this case, the most powerful guarantee the ID application provides positively impacted on acceptance by government employees. M3 said e-payment should be secured:

> "By using Cyber-source with Central Bank Oman (CBO) getaways" (M3, Institution C).

M8 added:

> "We are using the National Payment Portal provided by ITA and it is implemented for all services requiring payment" (M8, Institution L).

In short, each of the three sub-themes, infrastructure, budget and security affected the institution's readiness to improve e-government services in different ways, as described above. This was seen because of greater willingness to accept the e-government services. Thus, it was found in this research that the readiness of an institution to improve the e-government services depends on a strong infrastructure, a realistic budget and appropriate security measures. These three issues were found to have an impact on the unified approach of e-government services. This will be discussed more comprehensively in Chapter 7.

5.4.4. Trust

These successful factors are derived from several references in the literature review that were similar to the interviews with employees, government officials and citizens who participated in this academic study, which all stated that trust is unique to enriching and improving e-government services as well as the difficulties (Mpinganjira et al., 2015).

A few important issues have been found to affect the acceptance of the use of e-government services. Participant O2 confirmed that:

“Ministries need plans to increase the number of users of e-government services; including the provision of trustworthy and fast electronic services” (O2, Institution H).

M9, M12, M14 further confirmed that to enhance the usage of online services, trust and accountability among government institutions are needed to improve and develop services as quickly as possible or even immediately to increase the number of e-government service users (M9, Institution M, M12, Institution O, M14, and Institution Q). In addition, M11 stated:

“The citizen, resident and visitor will trust the electronic transactions and be satisfied with the services provided through the portals” (M11, Institution N).

M4 also confirmed that:

“Unifying the methodology of e-government services will positively affect the acceptance and increase the number of users because of the confidence

acquired by the countries that that follow the classification of United Nations standards for e-government" (M4, Institution D).

Thus, significant implications were found for the acceptance of e-government services from interview data, namely, adopting a unified systematic approach to service improvement and involving the community in the process of implementing improvement of these services, as they are the key to accessing these services. This has helped to generate confidence for users in e-government services. However, most participants stated that trust in the electronic services provided by the Omani government was still low and that they had connected trust in accepting the use of e-motivational services. Some government agencies realized the importance of this trust.

5.4.5. Content

The content is supposed to be connected to the local language(s), which is important to stimulate adoption and integrity for all segments of the community, and to facilitate local services and meet local needs. For example, in India, there are around 26 languages, which pose a great challenge to representing online service in one common language. The content is not absolute, but reflects the rise in the use of the Internet among non-English speakers. Raising awareness of requires great effort. (EGDI UN 2018).

T1 explained that the most important components and links to highlight the content are available on the home page:

> "to help users easily see content, provide users with enough time to read and use the content, make text content understandable and readable, use of Web Content Accessibility Guidelines 2.0 (WCAG2.0). Adding windows to the ministry's social networking sites, Adding information/links to healthcare, including treatment abroad, and the reduced number of audits of health institutions, and education" (T1, Institution E).

Regarding the content language, O1 said:

> "the site works in both Arabic and English but at the current stage the Arabic language has been activated only because of the lack of English content" and added "We in IT strive to develop the site to be in line with the latest technologies available in the market, therefore, we intend that, in the coming period, all the services provided by the ministry will be available through the website, as well as all services provided by the ministry to employees will be available gradually through the site" (O1, Institution F).

In addition, M5 commented:

> "Always work on developing and taking the beneficiaries' observations and applying them to the content of the site and the presentation of the services, so that the site always enjoys the satisfaction of the beneficiaries in general" (M5, Institution G).

M8 added that the ministry works to:

> "Minimise the content as much as we can to further simplify the content and layout" (M8, Institution L), "provide basic content links on the main menu" (M4, Institution D) and to make "content lighter" (O4, Institution O).

M9 said the payment content includes:

> "Online payment is available for the following services: Traffic fine payment, Vehicle Renewal, Visa on arrival application, Customs services" (M9, Institution M).

M1 stated:

> "We hope that after the implementation of the consultancy study, the site will have a positive effect for all government services provided by the ministry to citizens and investors. All digital transformation initiatives such as e-certification, electronic signature, digital signature, multiple digital features, community groups with special needs, and older age categories will be introduced" (M1, Institution A).

> "Facilitate procedures, data availability and inclusiveness" (M2, Institution B).

> "The website was updated in April 2017 to meet the needs of the employee; student, researcher, resident and tourist; and any researcher or academic can search for information through the website" (M13, Institution P).

> "System-wide downsizing in procedures and services, Quick decision making, Transparency and Data flow between units" (M14, Institution Q).
>
> "Increased awareness and transparency by service providers, improve and reduce procedures" (T3, Institution K).

5.4.6. Usability

The use of ICTs has shown benefits and reliability in terms of affordability, flexibility and ease of use. For example, some e-governments around the world evaluate the practice of e-governance in some institutions around the world. These official gateways are then evaluated according to the 100 most wired countries (based on ITU data), in terms of providing public services and people's participation in governance and gatekeeping. Its evaluation categories were ease of use, privacy / security, provision of services, content, and citizen participation. (EGDI UN 2018).

The ministry has plans in place that could help in raising the profile and achieving better a ranking in the UN report by improving usability and instructional short texts especially in the services forms and publishing a well-designed service catalogue. M8 added usability and user experience design is about designing products to be effective, efficient, and satisfying. (M8, Institution L). While M10 stated that plans are to:

> "Enhance the web service to be friendlier and to have better usability and accessibility, in accordance with the international classification" (M10, Institution N).

M2 said:

> "I think a unified portal of e-services in the Sultanate of Oman will provide easy access to government and private services" (M2, Institution B).

M3 added:

> "Unified international digital government approach portal of e-services will be easy and available to access all private and government services (M3, Institution C).

O1 also explained that:

> "The government should press all government institutions to update their site design to suit the new changes imposed by modern technology in the global market. Unfortunately, many government websites in the Sultanate are still very primitive. Therefore, the ITA should prepare a unified template for designing government websites so that the rest of the institutions can redesign their sites according to this template provided that it is designed to suit the latest technologies. It must be convenient to browse through desktops, tablets or mobile phones. When the user finds that government sites are easy to navigate, there is no doubt that the demand for e-government services

> will increase significantly because users are very interested in sites that are easy to use" (O1, Institution F).

T2 explained how to raise and integrate the electronic services:

> "Easy access to electronic services according to a unified methodology known to beneficiaries. Different institutions in the state should help each other to develop a new, non-traditional model structure that integrates e-services in terms of smoothness, availability, ease of use and quality to reach user satisfaction … the ease of navigation through international standards was taken into account and the opinion of the specialists in the Information Technology Authority was taken into consideration" (T2, Institution I).

O2 said:

> "As directed answer, we mostly follow website design standards" like "Navigation tools, Zooming, file format & colours, Help & support tab which provides FAQ, different interactive channels (email, phone, feedback form) for answering the users enquiries. Currently we are working on creating a Video Helpdesk that will guide the end user in their use of E-services, undoing things that might help smooth access to our portal, Image description, Speech-Text Reader, Web content accessibility" (O2, Institution H).

M1 said:

"It is preferred to be a unified government portal for the Sultanate of Oman and not international for easy access to government and private services the ITA supervises this platform and guides the institutions how the organisations' sites comply with UN standards, evaluates these sites, identifies weaknesses and shortcomings, and sound guidance. It is possible to share links with international websites" and added "it has been linked with some institutions and is working with the rest of the institutions. Concerning the improvement and acceleration of e-services, the consultancy study has been completed to improve the services, document the type of service, description, the time taken for each service and the documents required for each service"(M1, Institution A).

"it has been linked with some ministries like ministry of health, Royal police of Oman and ministry of Endowments and Religious Affairs of Saudi Arabia" (M2, Institution B).

"Provide accessibility to physically disabled persons" and "it has been linked with the Central Bank of Oman and some ministries that are related to our services (M3, Institution C)

"For its commitment to the implementation of international standards and the possibility of using these applications through advanced devices such as mobile devices, tablets and smart phones and open accounts in social networking sites" (M4, Institution D).

"To provide the most prominent electronic services provided by the bodies and maintain its presence and easy access 24/7" (M5, Institution G).

"Easy access to electronic services according to a unified methodology" (M7, Institution J).

"To make access easy from anywhere and anytime … ROP initiated data exchange and integration with more than 32 government entities in order to simplify the procedures of services" (M9, Institution M).

M10 and M11 said

"Enhance the web service to be friendlier and to have better usability and accessibility, in accordance with the international classification" and they added, "Design and develop a useful, usable, accessible, helpful design, and development ease of use" (M10, Institution N, M11, Institution N).

"The Ministry provides electronic services through two basic systems: **Employment system**: The services were linked electronically with the Manpower Registry and government agencies to provide a paperless environment. The second system is **human resources system**: provides e-paper services in the field of human resources management and is associated with other government systems such as the Ministry of Manpower to request salary certificate data" (T2, Institution I) and

added “Because of the existence of standards to provide services easily and to all segments of society” (T2, Institution I).

“The process will be reduced and facilitate the process of linking and integration” and added, “there is an integration plan with the relevant institutions, which is integrated with the e-transformation plan” (T3, Institution K).

“We have active integration with some Government entities and others are in progress (O2, Institution H).

“It will constitute an ease in user response “(O4, Institution O).

T1, M7, M12, M8 said:

“Easy access to different websites and social media and also increases the availability and performance of the systems” (T1, Institution E, M7, Institution J, M8, Institution L, M12, Institution O).

5.4.7. Quality

ICTs create a qualitative shift in the public sector in terms of transformational and facilitative powers, but governments remain fully responsible for the standards, quality and ethics of public services to ensure the impact of these services on all segments of the local and international community (EGDI UN 2018).

In order to improve, government institutions must cooperate with each other in terms of the accuracy of information and the management of shared information, and improve the quality of services to be presented to the public through which they can end all government procedures and services (e-government stage model: based on citizen-centric approach in regional government in developing countries).

T2 explained:

> “All government institutions must submit the quality department to the minister's office in order to achieve the required level and direct follow-up from the senior management to solve any problem in delaying electronic transactions. This will give the main motivation for the service providers to deliver quickly” (T2, Institution I).

M7 added that:

> “The quality department should be subordinate to the minister's office to promote continuous development of electronic services for all government institutions (M7, Institution J).

M8 said that:

> “The ministry must adhere to the processing time to comply with the articles of the service level agreements and to raise the quality of the service, as well as raising the application performance index (KPI) for the various reports and a detailed presentation of the user process time indicator for each service performed” (M8, Institution L).

> “The methodology of implementation of the e-government project is not done at the level of an institution, but at the level of the service itself and the procedures of the service (oriental architecture). The service

must be electronic from beginning to end; there is no human intervention (complete e-service)" (M1, Institution A).

"Yes, we use public key infrastructure (PKI); there is a virtue in the system of Hajj, Zakat and the new regulations" (M2, Institution B).

"Integration is done between our system and TAM portal by NORTAL … we use the Single Sign on Window provided by ITA to login to the system and to sign documents" (TAM Initiative) (M8, Institution L).

"The electronic signature was activated using the electronic authentication system submitted by the National Centre for Electronic Authentication in the Information Technology Authority (PKI) in the system of registration of candidates for municipal council elections in the second period" (O1, Institution F).

"Deal with the National Centre for electronic certification" (T3, Institution K).

Regarding quality characteristics, the times of the website calculator process are important to get more users of e-government services, and several observations were made by the people interviewed.

M2 said:

"There is an internal program to calculate the time of completion of the transaction, where no transaction is has taken more than 5 working days" (M2, Institution B).

"There is a program that calculates each service that is submitted to our ministry" (M3, Institution C).

> "There are reports and time plans for some services indicating the period of time the applications were submitted and then studying them until the completion of all stages of the application" (M5, Institution G).

M8 said:

> "Reorganise the organisation structure to achieve the effectiveness and efficiency of the delivered services (meet KPIs) … Process time is mentioned in each service, for example, licensing applications display a detailed process time indicator to the user so he can follow up with the application status. The ministry has to stick to the process time to meet the SLA articles and prevent poor service quality … The ministry must adhere to the processing time to comply with the articles of the service level agreements and to raise the quality of the service, as well as raising the process performance indicator (KPI) for the various reports and a detailed presentation of the user process time indicator for each service performed" (M8, Institution L).

> "The date and time are captured for each application, but it does not calculate the process time yet" (M10, Institution N).

> "There is time calculated, but has not activated, the idea exists, and dash has been considered as a station to clear transactions in two weeks' time" (M11, Institution N).

> "So far there is no system for not providing electronic services to customers" (O1, Institution F).

> "We have time stamp only" (O2, Institution H).

> "It has been taken into account in the current development of the portal" (O3, Institution J).

> "Activation of the service agreement and the time frame for each service, and responding to queries quickly" (T1, Institution E).
>
> This will give the main motivation for the service providers to fast and fast delivery" (T2, Institution I).

5.4.8. Web Design

Efficient, effective services that are well designed and well delivered to users result from collaboration between ministries and joint governmental bodies to avoid duplication of efforts and assets lost (EGDI UN 2018).

O1 explained that

> "We did not look at the International Classification of Websites, but the ministry's website is generally designed with the latest technologies available. Our website is designed with specific features that make it easier for users to browse and access the information and services they provide … With the new technological revolution of mobile phones and the fact that most of the browsing is done on mobile phones, the new version of the site was designed in a way suitable for browsing using the browsers responsive phones designed with the technology bootstrap so that the site is fast loading and compatible with mobile browsers … In our view, the government should press all government institutions to update their site design to suit the new changes imposed by modern technology in the global market. Unfortunately, many government websites in the Sultanate are still very primitive. Therefore, the ITA should prepare a unified template for designing government websites so that the rest of the institutions can redesign their sites according to this template provided that it is designed to suit the latest technologies" (O1, Institution F).

While M5 said

> “The Ministry has followed advanced standards in the design and structure of the site, making it easier for the user to access the information in easy ways, some tools can help with this by enlarging the text, alternative texts for images, and searching the workbook” (M5, Institution G).

T3 explained

> "The United Nations standards have been adopted in the design of the portal … the team is currently rebuilding the official gateway to meet future technology requirements [for] user-friendly design … The user's experience revolves around designing the product to be effective, efficient and satisfactory to reach all users. The inclusion includes a wide range of problems including access to hardware and software, Internet connectivity and quality; computer skills and skills; economic situation; education; geographical location; language; age and disability" (T3, Institution K).

M6 stated that the design supports most synonyms, formatting pages, colours and animations:

> "Our website has been designed with certain features that make it easier for users to browse and access the information and services they provide" (M6, Institution I).

It was designed under the supervision of ITA to be simple and clear.

“we designed our website so that content such as Official Seal (official government portal), Site map, search tool, RSS, contacts, help, FAQ, terms & condition, feedback, E-services, forms download are available. Using

international Languages (AR & EN) and related fields such as direction of language (right to left & reverse), Unicode ..etc, CSS: we used template CSS format not customised. He argued that “On the other hand, we do not comply with the standard in some points for example: W3C mobile device test, Open data as we created branch for it. But it does not meet the Open data standards such as: kind of data & format, Blogs, Request for proposals (RFPs) / tenders online, E-payment, in conclusion, we covered more the 55 % of those standards and working on the rest” (O2, Institution H).

“It does not meet all standards, but a new site is designed according to international standards and will be launched soon (T2, Institution I).

“Improved home page design to be more interactive and re-engineering the procedures for existing services” (T1, Institution E).

“Publish a well-designed service catalogue … continue process simplification and reengineering” (M8, Institution L).

“ROP portal keeps developing to include all eservices and simplify them … Studying and understanding users’ experiences and reengineering the online services according to their expectations” (M9, Institution M).

“Design & develop useful, usability, accessibility” (M10, Institution O).

“Helpful design, development, ease of use and accessibility” (M11, Institution N).

The Cabinet must press all government institutions to update their website design to suit the new changes imposed by modern technology in the global marketplace. Unfortunately, many government sites in the Sultanate are still very primitive. Therefore, ITA should prepare a unified template for the design of government websites so that other organisations can redesign their sites according to this model provided they are designed to suit the latest technologies. Browse desktop computers, tablets, or mobile phones. When the user finds that the government sites are easy to navigate, there is no doubt that the demand for e-government services will increase significantly because users are very interested in sites that are easy to use.
The Authority should also adopt the idea of developing electronic services under one roof, so that the Authority would only be concerned with the development of electronic systems and services and their dissemination to other institutions for their operation. Therefore, all services will be developed through similar technologies and designs combined with the services provided at Oman portal.

Some ministries cannot follow up on the United Nations classification required to improve e-government services. This is one of the reasons why Oman's rating has been reduced in the United Nations e-government reports.

Recently, government websites have emerged as the main portal for the provision of public services to citizens (Sandhu 2012; Alateyah et al. 2013). Research on government has found that web design is an important factor influencing citizens' desire to accept e-government services. The unified

design and structured content increase the diversity of users in the use of e-government.

5.4.9. Social Influence

Many social causes stand in the way of the user such as language, income, education, culture and electronic gap; these reasons are not an electronic barrier, but the social effects of new information technology, which cause lack of desire to use this modern technology. Insistence on the effective implementation of the use of e-government services can overcome the cultural challenges we face (Alzahrani and Goodwin 2012; Sandhu 2012).

Culture has several different factors, such as the values and behaviour of people, beliefs and religion. They are classified into three types: organisational culture, national culture, and security culture (Roer 2015).

Resistance to change by citizens may eventually lead to negative results with regard to e-government participation (Alzahrani and Goodwin 2012). Governments must therefore improve social life and create a knowledge-based society to accept modern technological developments (Alzahrani and Goodwin 2012; Sandhu 2012; Roer 2015).

Modern social networks are closely related to the adoption of technology and the use of e-government services. Although there are obstacles and challenges to any change or implementation, these challenges can be overcome (Bertot et al., 2010, p. 6). In addition, Medina and Rufín (2014)

argued that the level of satisfaction and acceptance is the decisive result of trust and transparency in any research.

As for social communication with government institutions, M6 said that

> "There are other channels of social communication such as (Twitter, YouTube) (M6, Institution I).
>
> "Moreover, there is a link to ROP accounts for social media such as Twitter, Facebook, Instagram, email and 24/7 call centre (M9, Institution M).
>
> "Our ministry have social media such as Twitter, Instagram, Facebook and landline phones respond to any queries" (M13, Institution P).
>
> "Social media such as Twitter, Instagram, Facebook and landline phones answer any queries" (M14, Institution Q).

T1 explain the work under way to connect with the Ministry of Manpower and the Ministry of Social Development and adding windows to the social networking sites of the ministry.

M4 explained that

"For its commitment to the implementation of international standards and the possibility of using these applications through advanced devices such as mobile devices, tablets and smart phones and open accounts in social networking sites" (M4, Institution D).

5.5 *Summary*

In order to explore the impact of a unified approach of e-government service on the cloud, this chapter presents qualitative data collected from interviews. The results were divided into different topics arising from analysis of interview data. The main conclusion of this chapter was that the acceptance of e-government service was a very important factor to institutions.

It is necessary to conduct a questionnaire to take the views of users of e-government services and take their views in several factors to cause the success of these e-government services and increase the number of users in terms of six key factors (trust, quality, security, content, web design and usability). According to the research design of this study, these qualitative results were used to establish the quantitative method (survey) to explore the usability of e-government services in the context of this study.

Traditional service systems have ranged in different channels: face to face (human to human); or even through virtual service systems (from home to home); or the use of electronic services over the Internet, including the integration of traditional systems and virtual systems together with the integration of the Internet and growth in e-service providers, any company which has chosen solutions designed to use technology to reduce or even eliminate communication between customers and employees.

Chapter 6: Technological Acceptance Model Approach

6.1 *Introduction*

Based on previous studies in terms of the success factors, this chapter rearranges the formulations in the form of a research model to be applied in the quantitative test of these results. It also provides the model of their association with each other, and then presents the hypotheses of each relationship within the model. The survey process is then developed and the questionnaire items are presented in detail. Finally, the pilot study, which was conducted to verify the consistency of the elements of the questionnaire before the questionnaire was developed electronically, is presented.

6.2 *Introducing the research model*

6.2.1. Theory of reasoned action (TRA)

TRA (Fishbein and Ajzen 1975) is a theory from social psychology. TRA believes that the strength of an individual's intention affects the actual behaviour. The behavioural intentions are affected by two major factors - attitude towards the behaviour and subjective norms. The former refers to an individual's positive or negative view of certain behaviours. The latter refers to the social pressure associated with certain behaviours. TRA is one of the most fundamental and influential theories in explaining human behaviours. It has

been widely used in research in different fields (Sheppard et al. 1988). In study of technology acceptance, a lot of studies have proven that this theoretical model effectively predicts and explains users' reasons for using information system (Davis et al. 1989). Later researchers proposed different frameworks based on the TRA:

6.2.1.1. Theory of planned behaviour (TPB)

TPB was proposed by Ajzen (1985). It is an extension of TRA to explain and predict human behaviours in different conditions. According to TPB, a person's behaviours are from their own. People can completely decide whether to have certain behaviours. Other than own will, some behaviours may be affected by resources and opportunities. When people lack ability, resources or opportunities for certain behaviours or earlier experience making them feel difficult, it is unlikely for them to have such behaviours in strong will. That is, behaviours are not merely affected by one's motivation but also non-motivating factors such as time, skills and knowledge. The ability to control behaviours is also important in affecting behaviour will. Therefore, Ajzen added perceived behaviour control in TRA. He defined perceived behaviour control as reflected perceptions of internal and external constraints on behaviour and encompassing self-efficacy, resource facilitating conditions, and technology facilitating conditions. When predicting behavioural intentions, TPB holds that, other than exploring behaviour attitudes and subjective norms, opportunities, resources and control ability also affect behavioural intentions.

6.2.1.2. Technology acceptance model (TAM)

Based on TRA, Davis et al. (1989) proposed TAM in which outside factors of users accepting new technology are through intermediate factors of perceived usefulness and perceived ease of use to affect users' behavioural intention. The perceived usefulness refers to the degree to which a person believes that using a particular system would enhance his or her job performance (e.g. reducing time to complete work or providing in time information). The perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort. TAM succeeds the basic spirit of TRA, believing that beliefs affect attitudes, which in turn affect behavioural intention, which then also affect actual behaviours. The technology acceptance model does not include subjective norm. In studies of technology acceptance behaviours, TAM has been used as the theoretic foundation of many empirical studies with a significant amount of empirical support. TAM has advantages of parsimony, specific constructs, powerful theoretic foundation and a lot of support. Overall, from results of empirical analysis, TAM has approximately 40% accuracy in predicting users' level in a system (Legris et al. 2003).

6.2.1.3. Extended technology acceptance model (TAM2)

Using the TAM as the starting point, the TAM2 incorporates additional theoretical constructs spanning social influence processes (subjective norm,

voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use). Both these process types are found to significantly influence user acceptance. The TAM2 extends the TAM by showing that subjective norm exerts a significant direct influence on usage intentions over and above perceived usefulness and perceived ease of use for mandatory (but not voluntary) systems (Venkatesh and Davis 2000). This is one of the most widely used models in technology adoption research.

6.2.1.4. Combined Technology Acceptance Model & Theory of Planned Behavioural (C-TAM-TPB)

Taylor and Todd (1995) held that TAM failed to include factors of society and control that have been proven to affect actual behaviours. The two factors are also key factors in TPB. As a result, Taylor and Todd (1995) integrated TAM and TPB to include subjective norms and perceived behavioural control into technology acceptance models, and proposed C-TAM-TPB with an empirical study made on the use of a computing resources centre by students. Taylor and Todd's (1995) empirical results show that C-TAM-TPB has high fitness in explaining users' behaviours of using new technology. From analysis of grouping users based on experience, C-TAM-TPB shows quite good fitness on both experienced and inexperienced users.

6.2.2. Other related technology acceptance behaviour models

6.2.2.1. Innovation Diffusion Theory (IDT)/ Diffusion of Innovation (DOI)

IDT by Maddux and Rogers (1983) is most frequently used to predict and explain the use of innovation and diffusion behaviours (Moore and Benbasat 1991). Maddux and Rogers (1983) believed innovation and diffusion referred to new technologies, methods or ideas and when, where, why and how innovation objects were used. IDT believes that determination of certain innovation is not temporary behaviour but a model after a series of activities and decisions. Five factors affecting individuals and attitudes towards innovation include relative advantages, compatibility, complexity, trialability and observability. Innovation issues were valued. Later researchers studied information technology acceptance behaviours based on IDT. Some researchers found a more profound exploration and analysis of innovation characteristics in IDT. Different scales of innovation were designed for different industries (Moore and Benbasat 1991; Karahanna et al. 1999). Some researchers combined IDT and other theories for verification. Taylor and Todd (1995), in the study of consumers using innovation products, combined IDT and Decomposed Theory of Planned Behaviour as analysis models; Liao, Shao, Wang and Chen (1999) quoted IDT and TPB to explore consumers' behaviours of using virtual banks.

6.2.2.2. Social Cognitive Theory (SCT)

SCT by Bandura (1986) integrates ideas of behaviourism and social learning. It is a widely accepted model and has been used in a lot of empirical studies on individual behaviours (Compeau and Higgins 1995). SCT holds that environment, personal (motivation and attitudes) and behaviour factors affect individual behaviours (Bandura 1986). SCT further points out that self-discipline behaviour in motivation and behaviour performance are the result of different self-discipline mechanisms. The key self-discipline mechanism is self-efficacy, which refers to the judgment of one's ability to use a technology to accomplish a particular job or task (Bandura 1986) or the gathered beliefs. Self-efficacy involves the ability of one person to motivate realization, cognized resources and ability to use control during activities. With different self-efficacy levels, people increase or decrease their motivation and efforts to solve problems. Gist and Mitchell (1992), reviewing papers on self-efficacy, categorized causes of self-efficacy into mission need analysis, experience attribution analysis and individual or situational resources limitation. Compeau and Higgins (1995) believed that self-efficacy was determined by significance, strength and generalization ability. In a study of technology acceptance behaviours, Compeau and Higgins (1995) included emotions and expectation into the SCT model for analysis; Igbaria and Iivari (1995) included anxiety into SCT to discuss use of computers; Compeau and Higgins (1995) integrated the preceding study results on SCT for empirical analysis on variables of direct influence on users using computers; and Venkatesh and Davis (2000) combined SCT and TAM for analysis.

6.2.2.3. Model of Personal Computer Utilization (MPCU)

Thompson et al. (1991) established MPCU to explain problems of PC utilization. This model resulted from the individual behaviours model by Fiedler et al. (1971). The individual behaviours model held that factors determining one's behaviours included attitudes, social norms, habits and expected results of the behaviours. Attitudes cover cognitive, affective and behavioural components. In MPCU, factors affecting PC utilization include perceived consequences, affect, social factors and facilitating conditions. Perception results cover complexity, job fitness and long-term consequences. Thompson et al. (1991) conducted an empirical study of knowledge workers in the manufacturing industry. The findings show only society, complexity, job fitness and long-term results have a significant influence on PC utilization. Though MPCU relations were not proved to exist, scholars still base some research on the MPCU framework. Thompson et al. (1991) added users' experience into MPCU to explore adjustment results of experience on dimensions of PC utilization models; Al-Khaldi and Wallace (1999) analysed knowledge workers' behaviours of PC utilization in Saudi Arabia with MPCU; Cheung, Chang and Lai (2000) modified MPCU to explore the use of the Internet. Chang and Cheung (2001) revised MPCU to discuss behavioural intention of use of the Internet.

6.2.2.4. Motivation Model (MM)

Motivation is the process to push an individual to achieve desired goals or complete work or to focus one's efforts or energy to meet certain needs

(Herbert and Lumsden 1976). In technology acceptance research, Davis et al. (1992), from a motivation viewpoint, discussed users' technology acceptance behaviour issues, and developed technology acceptance behaviours MM to explore users' motivation for utilising information systems. MM claims that behavioural intention of using new technology will be affected by users' internal motivation and external motivation. Internal motivation is the perception that users will want to perform an activity "for no apparent reinforcement other than the process of performing the activity per se"; external motivation refers to the perception that users will want to perform an activity "because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions". With information system italicization characteristics, enjoyment of information system is the internal motivation, and perceived usefulness serves as users' external motivation (Davis et al., 1992). Empirical results by Davis et al. (1992) show that perceived usefulness and enjoyment have a significant influence on users' utilization of new technology in behavioural intentions. The influence of perceived usefulness on users' behavioural intentions far exceeds that of enjoyment on users' behavioural intentions. Venkatesh and Speier (1999) continued ideas in MM to discuss the influence of users' mood in accepting information system training on their internal and external motivations. The results show that moods do not have any significant influence on external motivation. However, positive moods have a significant influence on internal motivation and users' behavioural

intention in the short term. Negative moods have a significant influence on both short and long-term internal motivation and users' behavioural intentions.

6.2.2.5. Unified Technology Acceptance of Use Technology (UTAUT)

In the field of study of users on technology acceptance behaviours, a great number of theory models were developed, troubling researchers in selecting and constructing models. Venkatesh et al. (2003) developed an integrative theory – UTAUT to help future study in this field to find more dimensions affecting users' behavioural intention and enhance explanation ability of the model and comprehension of users' behaviours. Venkatesh et al. (2003) arranged earlier major models in a comparative empirical study. It was found the models' explanation ability of behavioural intention was between 17% and 42%. Some variables lost explanation ability with increase of experience. Venkatesh et al. (2003) arranged the four most influential variables from earlier studies – performance expectancy, effort expectancy, social influence and facilitating conditions. Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance; effort expectancy refers to the degree of ease associated with the use of the system; social influence covers the degree to which an individual perceives it to be important that others believe he or her should use the new system; facilitating conditions refers to the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system.

6.2.2.6. Unified Technology Acceptance of Use Technology 2 (UTAUT2)

The UTAUT2 model is geared towards the consumer context (Venkatesh et al. 2012). Since citizens are the prime consumers of e-government services (Shareef et al., 2011), the UTAUT2 model is appropriate for the e-government context. Moreover, the UTAUT2 has produced an 18 percent increase in explained variance in behavioural intention (Venkatesh et al., 2012). Hence, the UTAUT2 model is based on a tried and tested theory. This model by Shareef et al. (2011) is mainly geared for the e-government context. Shareef et al. (2011) investigate e-government adoption using different service maturity levels.

6.3 *Model constructs and hypotheses*

Builds the model and hypotheses the proposed conceptual model consists of six sub-models (Trust, security, quality, web design, usability, and content).

A new and unified model has emerged that reflects the consolidation of e-government services to increase users of these services. The following sections will present the formulations included in the model, with their theoretical background and their association with the proposed hypotheses.

The following structures emerged from the analysis of the views of citizens and government collected as qualitative data and discussed in chapter four.

6.3.1. Behavioural intention to accept using e-government services

Behavioural intention (BI) is defined as "subjective probability that he or she will engage in a given behaviour" (Committee on Communication for Behaviour Change in the 21st Century, 2002, p. 31).

BI is a behaviour that is determined and acted upon by questions such as "I intend to [behaviour]" with Likert scale options to measure the relative strength of the intention. The intention to measure is represented by other synonyms such as "I plan to [behaviour]" and distinct from similar concepts such as desire and self-prediction (Armitage and Conner 2001).

Ajzen (1985) argued that BI reflects how strongly a person wants to finish his or her experience, and how much motivation in order to achieve the theoretical behaviour, involves BI as the most likely prediction of behaviour (Ajzen 1985). In this context, individual behaviours seek to achieve a greater goal, such as better use of electronic services or failure to finish government procedures manually.

BI has found high and correct behavioural predictions, suggesting that respondents generally categorize their intention to perform the behaviour in question. The meta-analyses reviewed, which included health behaviours, found from 19% to 38% of the variance in behaviour demonstrated by BI (Sheppard et al. 1988; Sheeran and Orbell 1998; Armitage and Conner 2001).

6.3.2. Security in e-government services

Security and privacy are serious concerns of e-service users and are known as the critical barriers to e-service usage (Vassilakis et al. 2005).

More specifically, the security issue is perceived as the main concern, which manifests itself in the form of refusing the electronic services. As a result, security concerns will substantially affect the users' intention to use e-services (Shareef et al. 2011). In a recent study conducted by Taherdoost (2017), it is concluded that many individuals are not willing to use e-services due to security issues. He mentioned that e-service providers often collect a variety of sensitive personal information from their users in order to understand customer needs and provide better services. Accordingly, privacy and security features have become a serious concern for e-service usage. The gap between the actual security level of e-services and users' perceived security level has an impact on individuals' behaviour and can influence their decision (Taherdoost 2017). He articulated that e-service security and privacy has an impact on users' intention to use e-services and may affect their decision-making regarding e-services.

To conclude, as the influence of security on acceptance decisions of users has received limited attention, this research contributes to acceptance theory with consideration of proposing a model that puts the spotlight on the influence of security on end-user intentions to use e-services and e-service acceptance.

On the other hand, security concerns will, in turn, affect the users' intention to use e-services (Shareef et al. 2011). Actually, the security issue is currently one of the major concerns which manifest in the form of users refusal of electronic services.

According to Taherdoost (2017), security refers to the users' perceptions of security and is defined as the extent to which users feel that security is significant in a particular application, as well as the customers' beliefs about the extent to which they can safely use the application – in other words, how safe or secure they feel while using the application.

Furthermore, the devolved model contains both technological and social aspects in the context of e-services. For instance, intentions to emphasise the social impact of using e-services while security, trust and quality address the technological aspects.

H1: Security will have a direct positive impact on the Behavioural intention to accept using e-government services.

6.3.3. Trust in the use e-government services

Previous studies have confirmed that trust is a key factor in all ICT operations (Creswell et al. 2011; Anthopoulos and Sirakoulis 2015; Lallmahomed et al. 2017). The efficiency of government institutions enhances mutual trust among relevant parties (Tamilina and Tamilina 2018).

Thus, the delivery of services is limited to the provision of essential services such as trust in the government (Shalini 2009; Morgeson and Petrescu 2011;

Porumbescu 2016), and trust in electronic services (Papadopoulou et al.; Warkentin et al. 2002) Commitment of the government and institutions, which represents the official institution in this context. Add "institutional obligations" as the trust of citizens in the use of e-government services.

Carter and Bélanger found that the compatibility of trust had direct and positive relationships with the behavioural intention of using e-government services (Carter and Bélanger 2005). Citizens' trust leads to the adoption and use of e-services provided by governments. Confidence in government is confidence in the initiative to use e-government services. They must trust in the legal and administrative procedures and systems provided by the Government to secure users and ensure their privacy and the integrity of their information (Dwivedi and Bharadwaj; Warkentin et al. 2002).

Rose et al. claimed that the commitment of government institutions to implement e-government services leads to the satisfaction of citizens and their trust in government (Lin and Hsiao 2014). This commitment, which is linked to all components of government, institutions and departments, is integrated with other success factors. Thus, without this relationship, there will be a flaw in implementation. Therefore, the following hypothesis is presented:

Trust is the willingness of the individual to accept positive expectations about the intentions or behaviour of another person in a situation of interdependence and risk (Ennew and Sekhon 2007).

When reviewing the literature on acceptance of using e-government, trust was found to be a major indicator of behavioural intentions e.g (Luo et al. 2010; Kim 2011; Venkatesh et al. 2012; Sarkar et al. 2016).

This is because user decisions will be dominated by the issue of security and trust when using e-government services. The attention given to this construction can be attributed to a high degree of uncertainty, indiscernibility, heterogeneity and ambiguity in the use of the Internet and technologies (Gefen et al. 2003).

Carter and Bélanger (2005) indicate that trust affects the intention of citizens to use e-government services and state that citizens must trust in all government institutions through which the service is provided electronically.

On the other hand, trust refers to “one’s perceptions regarding the integrity and ability of the agency providing the service” (Bélanger and Carter 2008: 167).

E-government relies on the belief that government institutions have the resources to effectively implement e-services and are able to secure services (Bélanger and Carter 2008). Therefore, the addition of confidence will complement the current factors of UTAUT2 and is expected to have a direct impact on behavioural intention towards the use of e-government services. In this study, users' intention is to use e-government services, so if the level of trust is sufficient, the user is likely to rely on it. Thus, we propose the following hypothesis:

H2: Trust will have a positive impact on behavioural intention to accept using e-government services.

6.3.4. Performance Expectancy (PE)

Venkatesh et al. (2012) redefined the original UTAUT model into a beneficiary context. Performance Expectancy is defined as the "degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh et al., 2012: 159); PE is similar to perceived usefulness in Technology Acceptance Model (TAM) and to relative advantage in the Diffusion of Innovations (DOI) model (Venkatesh et al. 2003). In this study, PE was used to explore expected performance and potential benefits in the use of e-government services. According to UTAUT studies, it is expected that if the user believes that the use of e-government services is useful and will add value to end e-transactions, they are likely to adopt the use of e-services. In contrast, the following assumption was made:

H3: Performance expectancy will have a direct positive impact on the behavioural intention to accept using e-government services.

6.3.5. Effort expectancy (EE)

Effort expectancy is the "degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012: 159) and is similar to ease of use in TAM (Davis 1989). In the UTAUT, EE was a direct determinant of BI. In addition, a number of researchers found an indirect relationship of EE on BI through PE (Venkatesh and Zhang 2010; Lin and Hsiao 2014).

In this study, the inclusion of EE was to investigate beneficiary beliefs about whether the use of e-government services was effortless and to predict their behavioural determination to use e-government services. It is expected that if beneficiaries find that e-government services are easy to use, they are more likely to adopt and use these services. Therefore, we suggest the following hypothesis:

H4: Effect expectancy will have a direct positive impact on the Behavioural intention to accept using e-government services.

6.3.6. Social Influence (SI)

Social influence is the "extent to which consumers perceive that important others believe they should use a particular technology" (Venkatesh et al., 2012: 159) and is similar to social norms in TRA, TPB and TAM2. SI refers to social stress resulting from an external environment that may affect the perceptions and behaviours of the individual to participate in a given work (Venkatesh et al., 2003). The direct impact on SI of BI is that the fact that people may be influenced by others' opinions and therefore will participate in the use of certain behaviour even if they do not want to. Venkatesh and Davis (2000) argue that the SI effect occurs in environments that have less impact in a voluntary environment.

H5: Social influence will have a direct positive impact on the behavioural to accept using e-government services.

In the eGov context, Wang and Shih (2009), Gupta et al. (2008) and Al-Shafi and Weerakkody (2009) applied the UTAUT model in Taiwan, India and Qatar respectively.

Their results demonstrate that performance expectancy, effort expectancy and social influence are significantly related to behavioural intention. Several authors (Gupta et al. 2008; Alshehri et al. 2013; Alotaibi et al. 2016) have applied the UTAUT model in the eGov context and have found support for the relationships posited. In a number of studies, some of the relationships tested were not supported. For instance, Alshehri et al. (2013) findings show that social influence is not significant with behavioural intentions in Saudi Arabia. This may be due to context specific factors such as culture. Nevertheless, Rana et al.'s(2013) meta-analysis of the UTAUT model shows that performance expectancy, effort expectancy and social influence are significantly related to behavioural intention.

6.3.7. Facilitating Condition (FC)

Facilitating condition is defined as ‘‘the consumers' perceptions of the resources and support available to perform a behaviour" (Venkatesh et al., 2012: 159). In this study, FC will measure the perception of users about whether they are able to access the required resources to use e-government services. Thus, the importance of external influences in facilitating conditions for decision-making is crucial to human behavioural roles in information system studies (Dwivedi and Bharadwaj; Alryalat et al. 2013). Therefore, it is

important to know whether FC has a direct impact on behavioural intentions towards the use of e-government services. It is expected that these external resources will lead to beneficiaries' use of e-services. Accordingly, the researcher suggests the following hypothesis:

H6: Facilitating conditions will have a positive impact on the behavioural intention to accept using e-government services.

6.3.8. Quality in e-government services

The success of e-government services can be enhanced through consideration of e-service quality as it can increase attractiveness, customer retention, hit rate, positive word of mouth, and can take advantage of the online competitive advantages of e-service (Santos 2003) although research regarding quality of e-service issues is still in an immature phase. As long as service quality is an ultimate evaluation of the service under certain circumstances, customer acceptance of e-government services is considered as the exit point of specific service transactions (Jun, Yang, and Kim 2004).

The analyses of previous studies reveal that in spite of the significance of both quality dimensions, very few efforts have been made to not only identify their dimensions but also examine their potential effects on intention to use. Ultimately, a contribution in this domain is necessary; therefore, relevant dimensions of quality along with their effects on intention to use e-services should be identified coherently and comprehensively.

To conclude, as the influence of quality on acceptance decisions of users has received limited attention, this research contributes to acceptance theory with consideration of proposing a model that puts the spotlight on the influence of quality on end-user intention to use e-services and consequently e-service acceptance.

E-services (which refers to the services provided through electronic channels) could potentially increase the quality of the service (Zhang et al. 2006); so the end-users increasingly require the complete online services' availability (Agrey and Xu).

Raising the quality of the services provided electronically will help organisations achieve their goal of customers accepting the e-government services (Chang et al. 2015). In a competitive business environment, it is significant to understand customers' needs and deliver a high quality of service to encourage customers to accept e-government services (Suki 2014).

However, there are many different definitions for electronic service quality. For this study, e-service quality is defined as the users' evaluation of the excellence and quality of the e-service provided.

In general, to increase people's positive intentions towards the use of e-services, e-service providers should focus on these factors; security, quality, usability, trust, content, and web design. The results of this study can be a good foundation for the improvement of e-service usage in Oman.

H7: Quality will have a direct positive impact on the behavioural intention to accept using e-government services.

6.3.9. Price Value (PV)

Defined as ‘‘consumers’ cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them” (Venkatesh et al., 2012: 161), the price value has a positive effect on behavioural intention (Venkatesh et al., 2012). Citizens who use non-electronic government services will have to go to the site, fill orders by hand and make several trips according to their service. Thus, we re-examine the price value between the benefits of using e-government service and the cash cost of using traditional government offices. Using e-government instead of traditional government offices is expected to lead to savings for citizens. The Chong and Ngai (2013) study found an important positive relationship between price value and behavioural intention in the context of site-based social media. Regarding information technology, Venkatesh et al. (2012) explain that the value of price is closely related to the behavioural intention. Thus, we assume that:

H8. Price value will have a positive effect on behavioural intention to accept using e-government services.

6.3.10. Usability of e-government services

Considering the latest research by Zhang and Pi (2014), the study's methods mirror their previous research in 2003 where the usability of e-government

services was analysed in 100 cities, focusing on official indicators of a "usable" site.

The model was characterized by the most challenging tools to help with other simple tools. Therefore, other important pillars of e-government have been identified which differ from each other through the level of development and progress. Some of the cities investigated with the municipalities overlap in the focus of the study.

Thus, in the context of the analysis of the results, the results were compared with the results of Zhang and Pi (2014). In this way, it is possible to know the relevance of the aspects investigated. Thus, the results of e-government may highlight a new aspect and provide a new perspective on the development of the world's IT cities. Comparative usability analysis is therefore based on user-based task tests of government site information structures (Choudrie and Ghinea 2005).

Usability is an important factor for any website. Access to local government sites has been investigated by the Cabinet Office of the United Kingdom (2005); Chen and Thurmaier (2008) discuss some major access issues. Moreover, the authors assert that usability criteria must be in place to provide equal access to every citizen.

H9: Usability of e-government services will have a direct positive impact on the performance expectancy.

6.3.11. Web Design in e-government services

Website design and information quality also affect the adoption of e-government services. Oman e-government websites are still at the static phase and government authorities should rethink their e-government website design as it has been found to be significantly related to their intention to use e-government services (Al Salmi et al. 2016).

Websites should have a simplified design to make their use as easy as possible, bugs should be removed, and proper feedback mechanisms should be implemented to inform citizens of the status of their applications. Moreover, training sessions could also be organised to facilitate the uptake of e-government services (Alotaibi et al. 2016).

Suárez et al. (2018) argue that perceived self-efficacy has a direct or indirect effect on behavioural intention through ease of use. Hence, factors such as information quality and website design that affect ease of use may explain the negative relationship with behavioural intention.

Users may refrain from using electronic services if the Web site is complex and incorrectly designed and the information is not updated periodically, thus making it difficult to use and disassociate users

H10: The web design of e-government services will have a direct positive impact on quality.

6.3.12. Information content in e-government services

Users expect that e-service provides them with the latest information (Oghuma et al. 2016). So, the content of the website should be updated and currently reviewed by the provider. Moreover, content should be reliable, correct and free of error.

Some governmental websites offer mature content and utilities, without appropriate accessibility and retrievable information - they cannot satisfy the needs of their citizens. When planning the advancement of their websites, the governments should focus on both aspects — mature content fulfilling the expectations of the users, and a usable navigation system enabling citizens to actually access this content.

Governmental websites are boundary documents and address different user groups. Nearly all websites apply tabs to support navigation to user-specific content. However, only one eGovernment included a more detailed support in the form of an instruction sheet. Nevertheless, when applying task-based evaluation of the superficial navigation system, the supporting boundary documents do not seem to play a significant role.

In order to achieve this, instructors should improve the content quality of their e-learning systems by providing sufficient up-to-date content that can fit citizens' needs (Sekaran and Bougie 2016).

The Government should update the legal framework to suit cloud-based e-government services, fill gaps and protect information and data (content,

privacy, service conditions, security, electronic signatures and authentication) (Mitrovic et al. 2013).

Singapore has worked hard to identify and provide common services to minimise cost (such as web content management, software as a service and government cloud platform). In addition, new central services will be added to share government-wide web services, payment and consolidation at the government level to achieve cost savings (Hashemi et al. 2013).

In India, the content of the portal has been developed with the participation of various ministries and government departments of India to modernize and improve the government portal in a systematic manner, which has enriched the portal and improved day-by-day in terms of design, content and technology Http: // bharat.gov.in (Chander and Kush 2012)

Among the indicators for the development of the site, the authors focused on several factors such as comments, search option, language, accessibility, citizen services, content, and consideration of people with special needs during the design of any web portal (Chander and Kush 2012).

Content is the key to the success of any portal and therefore the information must be adequate for its citizens. Also, there should be no more or less on the portal because most problems in developing countries are due to bureaucratic difficulties and obstacles that lead to social evils or delay in providing services to citizens in a transparent manner (Chander and Kush 2012).

H11a: Content of e-services will have a direct positive impact on the effect expectancy.

H11b: Content of e-services will have a direct positive impact on the quality.

6.3.13. Effectiveness of unified approach of e-government services

H12a: Effectiveness of unified approach of usability will have a direct positive impact on the behavioural intention to accept using e-government services

H12b: Effectiveness of unified approach of security will have a direct positive impact on the behavioural intention to accept using e-government services

H12c: Effectiveness of unified approach of trust will have a direct positive impact on the behavioural intention to accept using e-government services

H12d: Effectiveness of unified approach of web design will have a direct positive impact on the behavioural intention to accept using e-government services

H12e: Effectiveness of unified approach of social influence will have a direct positive impact on the behavioural intention to accept using e-government services

H12f: Effectiveness of unified approach of facilitating condition will have a direct positive impact on the behavioural intention to accept using e-government services

H12g: Effectiveness of unified approach of quality will have a direct positive impact on the behavioural intention to accept using e-government services

H12h: Effectiveness of unified approach of cost value will have a direct positive impact on the behavioural intention to accept using e-government services

H12i: Effectiveness of unified approach of content will have a direct positive impact on the behavioural intention to accept using e-government services

The following table 6.1 includes a summary of all sixteen hypotheses from H1 to H12

Table 6-1 Model constructs and related hypotheses

Construct	Source in Literature	Hypothesis
Security	Torkzadeh and Dhillon (2002), Lu et al. (2003), Mohammadi (2009), Taherdoost and Sahibuddin (2015b), Taherdoost (2017)	H1: Security will have a direct positive impact on the Behavioural intention to accept using e-government services.
Trust	(Valentina 2004), (Davies 2015), Taherdoost and Sahibuddin (2015b), Mohammadi (2009)	H2: Trust will have a positive impact on behavioural intention to accept using e-government services.
PE	Luarn and Lin (2005), Venkatesh and Zhang (2010), Foon and Fah (2011) Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias	H3: Performance expectancy will have a direct positive impact on the behavioural intention to accept using e-government services.

	M. Lallmahomed (2017)	
EE	Luarn and Lin (2005), Venkatesh and Zhang (2010), Foon and Fah (2011) Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)	H4: Effect expectancy will have a direct positive impact on the Behavioural intention to accept using e-government services.
SI	Venkatesh et al. (2003), Venkatesh and Zhang (2010), Foon and Fah (2011), Sripalawat et al. (2011)	H5: Social influence will have a direct positive impact on the behavioural intention to accept using e-government services.
FC	Luarn and Lin (2005), Venkatesh and Zhang (2010), Foon and Fah (2011) Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)	H6: Facilitating conditions will have a positive impact on the behavioural intention to accept using e-government services.

Quality	van Riel, Semeijn, and Pauwels (2003), McKnight, Choudhury, and Kacmar (2002)	H7: Quality will have a direct positive impact on the behavioural intention to accept using e-government services.
Cost value	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)	H8. Price value will have a positive effect on behavioural intention to accept using e-government services.
Usability	Mahinda and Whitworth (2006), Venkatesh et al. (2003), Gwebu and Wang (2011), Luarn and Lin (2005), Venkatesh and Zhang (2010), Foon and Fah (2011)	H9: Usability of e-government services will have a direct positive impact on the performance expectancy.
Web Design	(Smith 2001), Semeijn et al. (2005)	H10: Web design of e-government services will have a direct positive impact on quality.
Content	(smith 2001), Mohammadi (2016), van Riel, Semeijn, and Pauwels (2003), Wixom and Todd (2005)	H11a: Content of e-government services will have a direct positive impact on the effect expectancy. H11b: Usability of e-government services will have a direct positive impact on the quality.

Effectiveness of unified approach	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)	H12a: Effectiveness of unified approach of usability will have a direct positive impact on Behavioural Intention to accept using e-government services. H12b: Effectiveness of unified approach of security will have a direct positive impact on Behavioural Intention to accept using e-government services. H12c: Effectiveness of unified approach of trust will have a direct positive impact on Behavioural Intention to accept using e-government services. H12d: Effectiveness of unified approach of web design will have a direct positive impact on Behavioural Intention to accept using e-government services. H12e: Effectiveness of unified approach of social influence will have a direct positive impact on Behavioural Intention to accept using e-government services. H12f: Effectiveness of unified approach of facilitating condition will have a direct positive impact on Behavioural Intention to accept using e-government services.

		H12g: Effectiveness of unified approach of quality will have a direct positive impact on Behavioural Intention to accept using e-government services. H12h: Effectiveness of unified approach of cost value will have a direct positive impact on Behavioural Intention to accept using e-government services. H12i: Effectiveness of unified approach of content will have a direct positive impact on Behavioural Intention to accept using e-government services.

6.4 *Survey development*

Following the discussion of the research methodology adopted in this paper, this chapter provides a detailed explanation of the development process of each survey tool. The researcher adopted survey tools that were tested and applied in experimental studies, as well as a new study developed to suit the newly emerging factors of the anarchic environment. This was followed by advice and encouragement from many researchers to design their own tools (Hofstede 2010).

Table 6-2 Questionnaire instruments and tools

Indicator	Instrument Items	Sources
Trust Construct		

12	I encourage the formal government institutions to expand their e-government services	Taherdoost and Sahibuddin (2015b), (Rabaa'i 2015; Rabaai et al. 2016)
13	E-government can reduce travelling long distances to obtain government services	(Davies 2015)
14	E-government services have the ability to perform the promised services accurately	Taherdoost and Sahibuddin (2015b), Mohammadi (2009)
Content construct		
15	Headings (e.g. titles of e-government services) are not clearly phrased, descriptive and understandable	(smith 2001), Mohammadi (2016)
16	Using e-government services provide me what I require	(smith 2001), Mohammadi (2016)
17	The information provided by e-service is accurate	van Riel, Semeijn, and Pauwels (2003), Wixom and Todd (2005), Al-Gahtani and King (1999)
18	E-service not provides the information content which meets my needs	
Usability construct		
19	I accomplish my tasks easier and quicker with e-government services	Mahinda and Whitworth (2006)
20	Using e-government service improves the quality of work I do	Venkatesh et al. (2003), Gwebu and Wang (2011)
21	The expected less time to finish the e-government services	Luarn and Lin (2005), Venkatesh and Zhang (2010), Foon and Fah (2011)
Quality construct		
22	I get very good quality out of e-government services	van Riel, Semeijn, and Pauwels (2003)

23	E-government service works very well technically	McKnight, Choudhury, and Kacmar (2002)
Security construct		
24	There are appropriate procedures in e-government services to prevent accidental loss of data	Taherdoost and Sahibuddin (2015b), Taherdoost (2017)
25	When using e-government services, I believe that certain managerial and technical procedures are implemented to protect my personal information	Lu et al. (2003), Mohammadi (2009
26	I believe that my confidential information is kept secure	Torkzadeh and Dhillon (2002)
Web Design construct		
27	Government websites are not organised logically by anticipated user need	(Smith 2001)
28	I am not satisfied with design of e-service	Semeijn et al. (2005)
29	E-government services attractively display information	
PE construct		
30	I would use e-government services anywhere	Luarn and Lin (2005), Venkatesh and Zhang (201)], Foon and Fah (2011), Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)
31	Using e-government services will make my life easier	
EE construct		

32	My interaction with e-government services is clear and understandable	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)
33	Operating e-government services is easy for me	
FC construct		
34	I have the necessary knowledge to use e-government services	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)
35	I can get help from others when I have difficulties using e-government services	
SI construct		
36	People who influence me think that I should use e-government services	Venkatesh et al. (2003), Venkatesh and Zhang (2010), Foon and Fah (2011), Sripalawat et al. (2011)
37	Most people surrounding with me use e-government services.	
BI construct		
38	I prefer to use e-government services	Venkatesh et al. (2003), Venkatesh and Zhang (2010), Foon and Fah (2011), Sripalawat et al. (2011)
39	I intend to use e-government services	
Cost Value construct		
40	I believe that using e-government services is good value for money	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed 2017
Effectiveness of unified approach of e-government services		
41	I think the framework of e-government services differs between countries making it difficult for people to access e-services	Taherdoost and Sahibuddin (2015b), (Rabaa'i 2015; Rabaai et al. 2016)

42.1	I can get help from others when I have difficulties using e-government services	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed (2017)
42.2	Secured	Taherdoost and Sahibuddin (2015b), Taherdoost (2017)
42.3	Comfortable web design	(Smith 2001)
42.4	Easy to use	Venkatesh et al. (2003), Gwebu and Wang (2011)
42.5	Well organized content	Mohammadi (2016)
42.6	Information Quality	van Riel, Semeijn, and Pauwels (2003)
42.7	will affect social impact	Venkatesh and Zhang (2010),
42.8	Will be trusted as it will be a standard model for most countries for the same list of services	Taherdoost and Sahibuddin (2015b), (Rabaa'i 2015; Rabaai et al. 2016)
42.9	Reduce the financial cost	Muhammad Z.I. Lallmahomed, Naguib Lallmahomed, Gias M. Lallmahomed 2017
Cloud Computing		
43	Cloud is a secured space for saving data.	Kadam Prasad; Jadhav Poonam; Khupase Gauri ; N. C. Thoutam 2015
44	I trust using the government cloud.	Joseph Kwame Adjei 2015

45	I have knowledge of what e-government services on cloud.	Fathey Mohammed, Othman Ibrahim, Mehrbakhsh Nilashi 2017

6.5 *Measurement tools*

Table 6.2 illustrates those measurement tools applied in the form of a questionnaire, with instruments associated with each model construct. They have been treated through recoding and erasing the pilot study.

According to Collis and Hussey, it is recommended that before the final survey is distributed a pilot study should be carried out for a small sample of the population (Collis and Hussey 2013). The primary aim of this pilot study is to ensure the validity and consistency of the questionnaire instruments. Furthermore, it ensures that the questionnaire is measuring what it has been designed to measure (Collis and Hussey 2013). The pilot study is also necessary to check the Arabic translation of each question for clarity and consistency in meaning in comparison with the original question in English.

This questionnaire was distributed among 33 selected participants. All participants were Omanis working in different areas of specialisation and their residency, to diversify the opinions for the sake of constructive comments and feedback.

The results obtained were tested for consistency and validity using the SPSS package. There were several comments regarding some of the instruments, and the feedback was constructive. Most of the points were taken into

consideration in the final version of the questionnaire. Some changes and removal of items were made based on the agreed comments advised by the people who have knowledge in the same field.

6.6 *Conclusion*

This chapter aimed to provide a closer look at the research model, which was formulated based on the studies previously conducted and discussed in chapter five. The components of the model were discussed separately and then concatenated together to construct the entire model. The hypotheses were introduced and then plotted on the research model. The instruments were then applied in the questionnaire, which were introduced and thoroughly discussed. The pilot study, which was conducted to test the consistency of the questionnaire items, was later discussed. This chapter has prepared the basis to perform the analysis in the next chapter.

Chapter 7: A Proposed Framework

7.1 *Introduction*

This chapter presents the results from analysing the quantitative data collected to address the research questions. Pallant (2016) illustrate, the data was organised according to the themes that emerged from the qualitative phase. The survey data were then scanned for errors by eliminating incomplete surveys and checking missing values. The data were then analysed using SPSS to understand the impact of unified approach of e-services on government cloud using statistical tests such as link testing and chi-square Test.

Plenty of scholars addressed the benefits and use of e-survey such as (Reynolds 2006). The benefit of e-survey using point of contact is no software compatibility issues, fewer computer access issues, access to populations without computers, identical instrument across all respondents, Technology available for multiple question formats, and Potential to capture data directly in the database. While, the drawbacks were cost of equipment, Scheduling time with respondents, finding acceptable location, potentially time-consuming development, the potential for time-consuming data collection effort and may is not able to reach the large sample.

7.2 *The collected Dataset*

The questionnaire was designed by using online smart survey https://app.smartsurvey.co.uk/. This is the link for these tools and can be purchased as a licence by months. The researcher benefited from the first free month of training and design of the first draft. At the end of the free month, the final questionnaire was published online. The survey remained online for almost two months. The size of the collected data is 440 and includes (please see the appendix B) which includes the survey questions. Data pre-preparation: all data was handled using excel and transferred to SPSS.25. There were 8 records of missing values that were included in this statistical analysis and this amount of records are considerable small and were delete during analysis phase.

7.3 *Performed test*

Since the questionnaire was published on the Internet, there is no place for humans to physically explain any difficulties that participants may face. However, each element in the instrument was examined for 33 participants to ensure that it was well understood previously. In addition, the time taken for the participants to complete the questionnaire was calculated, for an average of 15 minutes. The value of Cronbach's Alpha in this research was measured and recorded as 0.829, which was above the threshold of 0.7 and therefore acceptable. Hair et al. considered the threshold to be over 0.7, and considered that the threshold level can be accepted even if it is above 0.6 for exploratory

studies (J. F. Hair et al. 2014). This issue was introduced in chapter three, in detail.

7.4 *Normality Test*

Normality is a data validation test that represents the relationship between normal distribution and sampling methods on which the probabilities of normal distribution depend on the form of distribution. The idea is that the sample does not differ systematically from the population. If a sample is randomly selected from a community, it may not look the same as another sample of the same size randomly selected from the same group. But any differences between a selected sample and other random samples of the same size selected from the same population differ from each other randomly, not systematically (Urdan 2011). In other words, the closer the normal result to data publition, the better the results validation is. The researcher community agrees that a max accepted variation should not accede 5%.

This study uses MANOVA (multivariate analysis of variance), in testing normality. First, the research tests the **normality test for numeral variables** then use **normality test for categorical data**.

7.5 *Normality test for numerical variables*

In this study normality test uses. Statistically speaking, there are many tests to test normality, which is: W/S test, Jarque-Bera test, Shapiro-Wilks test, Kolmogorov-Smirnov test, and D'Agostino test. However, Shapiro-Wilk uses

here to test normality; this test is well-known and powerful for all types of distribution and sample size which might sample for more than 2000. While Kolmogorov-Smirnova (KS) which comparatively low in performance as found by (Razali and Wah 2011).

Therefore, this research uses Shapiro-Wilks and Kolmogorov-Smirnov to test normality with 95% confident interval, the Q-Q Plot of ministries bodies, distance to eService, minimum distance accepted by responders to access Internet, maximum distance accepted by responders to access Internet, and total challenges facing e-government services (Ghasemi and Zahediasl 2012).

Graphically tests of normality are Quality-Quaintly is named Q-Q probability plots and Cumulative frequency (P-P) plots as indicates all points are around the diagonal line for all questions: ministries bodies, distance to eService, minimum distance accepted by responders to access Internet, maximum distance accepted by responders to access Internet, and total challenges facing e-government services see Appendix D. Normality test for categorical data

The used method to test normality for categorical data is by splitting two categorical question, which are gender and age groups (Q.3 and Q.4). This given, all the coming categorical data are tested after including these two categorical data.

At first, males were tested in questions distance to service and, minimum distance accepted by responders to access Internet, maximum distance

accepted by responders to access Internet, and total challenges facing e-government services. The outputs of SPSS indicate normal distributed data. Second the normality test for females and age groups. Notably, that no females answer these questions from age group 50 and above. Secondly, females and age groups amongst respondents. The test also indicates normality for females and males see Appendix D.

7.5.1. Reliability and Validity Test

The study tested for reliability and indicated 0.829 which is greater than 0.70. The list of all question validity test is in the appendix D. All question were reliable and their Cronbach's Alpha were above 0.70. All question were reliable and indicated in Appendix D.

Table 7-1 Summary of cases

Case Processing Summary

		N	%
Cases	Valid	432	98.2
	Excluded	8	1.8
	Total	440	100.0

a. Listwise deletion based on all variables in the procedure.

Table 7-2 Result of Reliability test

Reliability Statistics	
Cronbach's Alpha	N of Items
.829	77

Although the reliability test show 77 items, there are actually 45 questions with five scale.

7.6 *Construct reliability*

Table 7.3 below illustrates the Cronbach Alpha where all the values are > 0.7.

Table 7-3 Construct reliability

Cronbach's Alpha	
Trust	0.828
Content	0.821
Usability	0.823
Quality	0.821
Security	0.821
Web design	0.820
Performance Expectancy	0.824
Effort Expectancy	0.828
Facilitating Conditions	0.824
Social Influence	0.824

Behavioural Intention	0.826
Cost Value	0.825
Effectiveness of Unified Approach	0.827
Cloud computing	0.822

7.7 *Data analysis for each model construct*

7.7.1. Trust

The first issue expressed by the participants was the trust factor while the main concern was to encourage e-government institutions to expand their e-government services. Out of 432 respondents, 96.8% expressed their acceptance/support the use of e-government services, while 2.5% of the sample were "neutral".

The second concern was to reduce the long-distance travel for getting government services as agreed by 99% of total respondents. Only 2 of them were "neutral".

The third concern was whether e-services can deliver what was designed for over 99% of respondents trusted it can while less than 1% were not sure.

The above-mentioned results can clearly show a high acceptance of using e-government services. There is a clear desire of utilising such services if they are available. This is seen as an opportunity for the government not to miss by carefully crafted their portals to reach Omani citizens.

7.7.2. Security

The majority of respondents were agreeing/strongly agreeing to questions related to data protection and security. Therefore, the following table 7.4 shows them two categories only. The results show that 70% of respondents are ready to accept the use of e-government services. They are confident that appropriate measures are in place to prevent accidental loss or damages of e-government services and their data.

Table 7-4 Security factors affecting user acceptance of e-government services

security	Strongly Agree & Agree	%
There is an appropriate procedure in e-government services to prevent accidental loss of data.	302	69.9 %
When using e-government, I believe that certain managerial and technical procedures are implemented to protect my personal information.	332	76.9 %
I believe that my confidential information is kept secure.	277	64.1 %

7.7.3. Portal Content

The following table 7.5 is showing that 77% of contributors are not clear about the meanings of headers and their contents while 68% are prepared to use the services, such figures would invite the government to re-visit all portals

and possibly utilise the proposed unified approach of e-services. It is also noted that 66% of respondents felt the contents do not meet the needs of e-government services.

Table 7-5 Portal Content, do they meet user expectation

content	Strongly Agree & Agree	%
Heading (e.g. titles) are not clearly phased, descriptive and understandable.	335	77.5%
Using e-government services provide me what I require.	294	68%
The information provided by e-service is accurate	237	54.9%
E-service does not provide the content information that meets my needs.	287	66.4%

7.7.4. E-Government Services Usability

It is clear from the following table 7.6 that the usability of e-government services have a great echo from the use of regular services in terms of speed, save time and avoid long distances. More than 80% of respondents stated that they do their tasks faster and easier with the use of e-government services that has positive impact on both citizens and employees. Moreover, more than

44% of respondents agreed that the e-government services will help to complete and expedite the transactions significantly.

Table 7-6 E-Government Services Usability

Usability	Strongly Agree & Agree	%
I accomplish my tasks easier and quicker with e-government services	371	85.9 %
Using e-government service improves the quality of work I do	193	44.7 %

7.7.5. Quality of E-Government Services

The majority of respondents 74% are agreeing that they can get high quality of services through the use of e-government. For those who know how to use the services, it is clear to them and believed to be working well. This is expressed in the table 7.7 below.

Table 7-7 Quality of E-Government Services

Quality	Strongly Agree & Agree	%
I get very good quality out of e-government services:	321	74.3 %

E-government service works very well technically	335	77.5 %

7.7.6. Web design

The web design factor of the e-government services is an important one that is not logically regulated to consider the expected user need. Therefore, 69% of respondents agreed it is in need to improvement. A high percent of 56% were not satisfied with the present design of e-services when it is believed it can offer attractive one so that users can finish their applications through websites. Table 7.8 express the above.

Table 7-8 Web Design Quality

Web Design	Web Design	%
Government websites are not organised logically by anticipated user need	298	69 %
I am not satisfied with design of e-service	242	56 %
E-government services attractively display information	265	61.3 %

7.7.7. E-government services performance expectancy

From the government point of view if the assigned network bandwidth if fully utilised, a full performance of the system is utilised. From the user side, if there

will be no interruption to provide services nor delay in application or loss of data input, it is considered for the system to be performing well.

Through the expected performance, the user has the desire to use e-government services from anywhere. Actually, 69% of respondents are happy and prepared to use such services. Moreover, 80% believed that e-services would have positive impact on their lives as displayed in the table 7.9 below.

Table 7-9 Performance Expectancy to use e-government services

Performance Expectancy	Strongly Agree & Agree	%
I would use e-government services anywhere place	298	69 %
Using e-government services will make my life easier.	346	80.1 %

7.7.8. E-government services effort expectancy

A strongly feelings were expressed in relation to effort needed to use e-government services. Table 7.10 below shows 76% of respondents would use the services if they are clear and understandable. If this is the case, then 80% would feel the operation of e-services would be easy.

Table 7-10 Effort Expectancy to use of e-government services

Effort Expectancy	Strongly Agree & Agree	%
My interaction with e-government services would be clear and understandable.	329	76.2 %
Operate e-government services would be easy for me.	347	80.3 %

7.7.9. E-government services facilitating conditions

The following table 7.11 is showing that 75% of respondents are agreeing that they have knowledge to use e-government services. Moreover, 58% they can get helped form other people how know to use e-services. This demonstrates the interaction of citizens in their willingness to use e-government services.

Table 7-11 Facilitating conditions to use e-government services

Facilitating Conditions	Strongly Agree & Agree	%
I have the necessary knowledge to use e-government services	336	77.8 %
I can get help from others when I have difficulties using e-government services	250	57.9 %

7.7.10. Social Influence to use e-government services

It is clear from the following table 7.12 people would be influenced by those around them. More than 60% of respondents stated that people who surround them are using e-government services therefore will have a positive impact on them.

Table 7-12 Social Influence to use e-government services

Social Influence	Strongly Agree & Agree	%
People who influence me think that I should use e-government services.	215	49.8 %
Most people surrounding with me use e-government services.	264	61.1 %

7.7.11. Cost value to use e-government services

The value of money is an essential element of any behavioural intention to accept the use of e-government services. The result shows that 90% of respondents are agreeing that e-government services will reduce the cost value as expressed in table 7.13 below.

Table 7-13 Cost value to use e-government services

Cost Value	Strongly Agree & Agree	%
I believe that using e-government services is a good value for money.	392	90.7 %

7.5 Hypothesis significance table

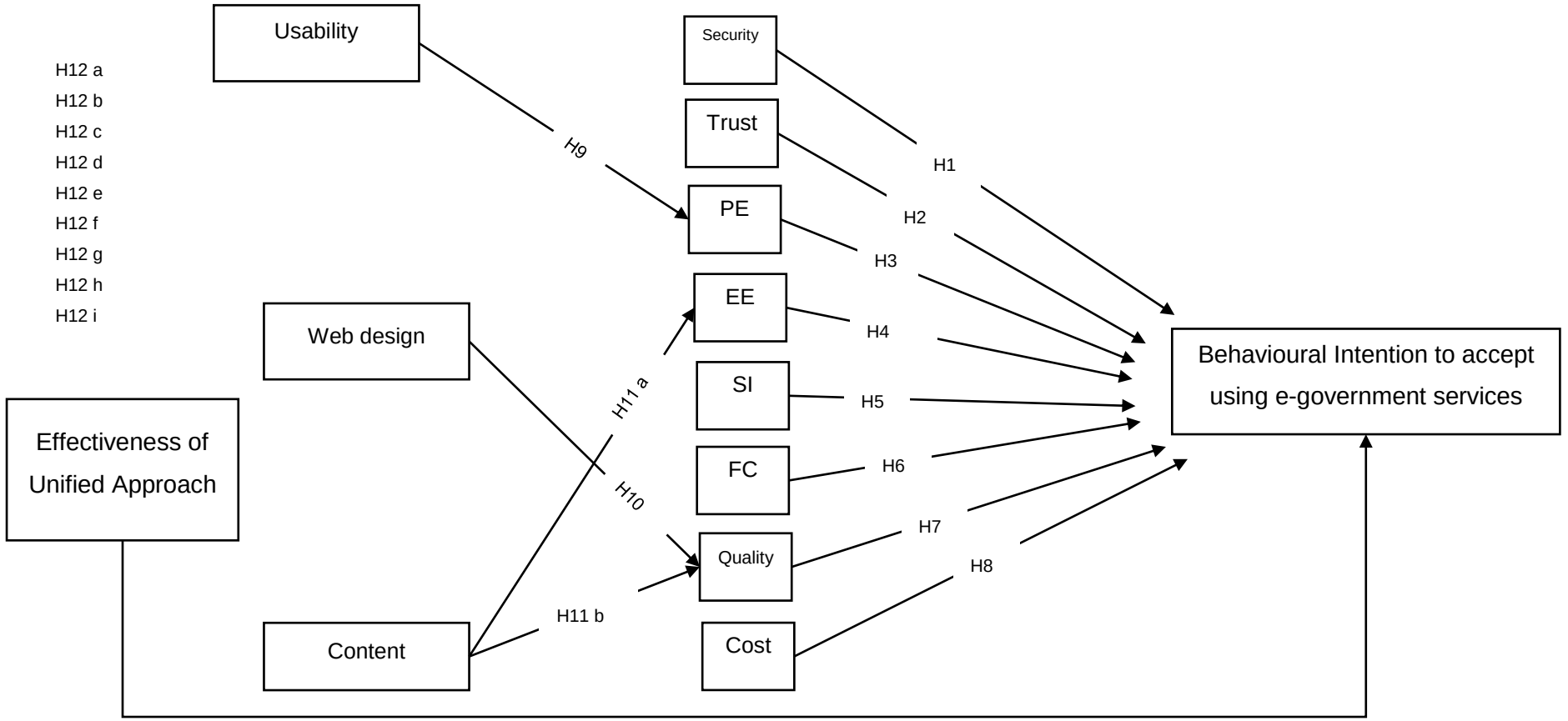

Figure 7-1 Acceptance of e-government services model

Table 7-14 Hypotheses significance table

	Relationship	Value	df	Sig
H1	Security will have a direct positive impact on the behavioural intention to accept using e-government services.	62.751	16	0.000
H2	Trust will have a direct positive impact on the behavioural intention to accept using e-government services.	15.846	8	0.045
H3	Performance expectancy will have a direct positive impact on the behavioural intention to accept using e-government services.	68.217	16	0.000
H4	Effort expectancy will have a direct positive impact on the behavioural intention to accept using e-government services.	55.255	16	0.000
H5	Social influence will have a direct positive impact on the behavioural intention to accept using e-government services.	40.000	16	0.001
H6	Facilitating conditions will have a direct positive impact on the behavioural intention to accept using e-government services.	57.474	16	0.000
H7	Quality will have a direct positive impact on the behavioural intention to accept using e-government services.	34.730	16	0.004
H8	Price value will have a direct positive impact on the behavioural intention to accept using e-government services.	48.146	16	0.000
H9	Usability of e-government services will have a direct positive impact on effort expectancy.	65.100	16	0.000
H10	Web design of e-government services will have a direct positive impact on the quality.	129.956	16	0.000
H11a	Content of e-government services will have a direct positive impact on the performance expectancy.	47.110	12	0.000

H11b	Content of e-government services will have a direct positive impact on the quality.	212.299	16	0.000
H12a	Effectiveness of unified approach of usability will have a direct positive impact on behavioural intention to accept using e-government services.	73.682	16	0.000
H12b	Effectiveness of unified approach of security will have a direct positive impact on behavioural intention to accept using e-government services.	115.280	16	0.000
H12c	Effectiveness of unified approach of trust will have a direct positive impact on behavioural intention to accept using e-government services.	36.256	8	0.000
H12d	Effectiveness of unified approach of web design will have a direct positive impact on behavioural intention to accept using e-government services.	45.273	16	0.000
H12e	Effectiveness of unified approach of social influence will have a direct positive impact on behavioural intention to accept using e-government services.	34.671	16	0.004
H12f	Effectiveness of unified approach of facilitating condition will have a direct positive impact on behavioural intention to accept using e-government services.	39.505	16	0.001
H12g	Effectiveness of unified approach of quality will have a direct positive impact on behavioural intention to accept using e-government services.	29.383	16	0.021
H12h	Effectiveness of unified approach of cost value will have a direct positive impact on behavioural intention to accept using e-government services.	53.024	16	0.000
H12i	Effectiveness of unified approach of content will have a direct positive impact on behavioural intention to accept using e-government services.	44.842	16	0.000

7.8 *Related factors*

7.8.1. Behavioural intention to accept using e-government services

The behavioural intention building case for the use of e-government services is a variable that reflects the real situations encountered by the participants and has a great relationship with security in improving the government services to be used through electronic portals.

Table 7.14 displays all hypothesis, value that represent the correlation between itself and other related factors, and the significance of the relationship. Such significance would be accepted when its value less than 5%. Figure 7.1 shows all relations between factors measured and hypothesis.

7.8.2. Effort Expectancy

It is clear from the model that the expected effort has a correlation between ease of use and also a direct relationship with the behavioural intention to accept the use of e-government services where H9 (coefficient path = 0.000, value = 65.100). The result indicates that the ease of use of e-government services will have a positive and direct impact on the expected effort.

7.8.3. Performance Expectancy

It is also clear from the model that the expected performance has a direct correlation with the content where H11a (coefficient path = 0.000, value =

47.110) and therefore the result indicates that the content of e-government services will have a direct positive impact on the expected performance.

7.8.4. Quality of e-government services

From the model, the quality factor has a direct correlation with the design where H10 (coefficient path = 0.000, value = 129.956). The result indicates that the design of e-government services will have a direct positive impact on the quality of services.

The quality factor also has a direct correlation with the content where H11b (coefficient path = 0.000, value = 212.299). Thus, the result indicates that the content of e-government services will have a direct positive impact on the quality of services.

7.9 *Descriptive Statistics*

7.9.1. Demographic output data

Table 7.15 below illustrates the frequency of collected data based on gender, age, using internet, and users' class. Mainly, to classify the collected data based on age, gender, citizens and government users.

Table 7-15 Demographic output data

		Category	Frequency	%
1.	Gender	Male	276	63.9%
		Female	156	36.1%

2.	Age	19 - 24	21	4.9%
		25 - 34	165	38.2%
		35 - 44	188	43.5%
		45 - 55	54	12.5%
		Above 55	4	0.9%
3.	Using Internet	Always	367	85%
		Usually	30	6.9%
		Sometimes	35	8.1%
		Never	0	0%
4.	Users Class	Citizens	360	83.3%
		Resident	8	1.9%
		Visitor	3	0.7%
		Business	43	10%
		Government Employee	213	49.3%
		Private Employee	31	7.2%

7.9.2. Data collected from Oman

The questionnaires were published and shared online using the social media platform. The sharing process resulted in the number of participants reaching 432 within two months. Demographically, after the researcher had published the survey online. The records show that the participants represented from different users' classes to the e-government services in Oman

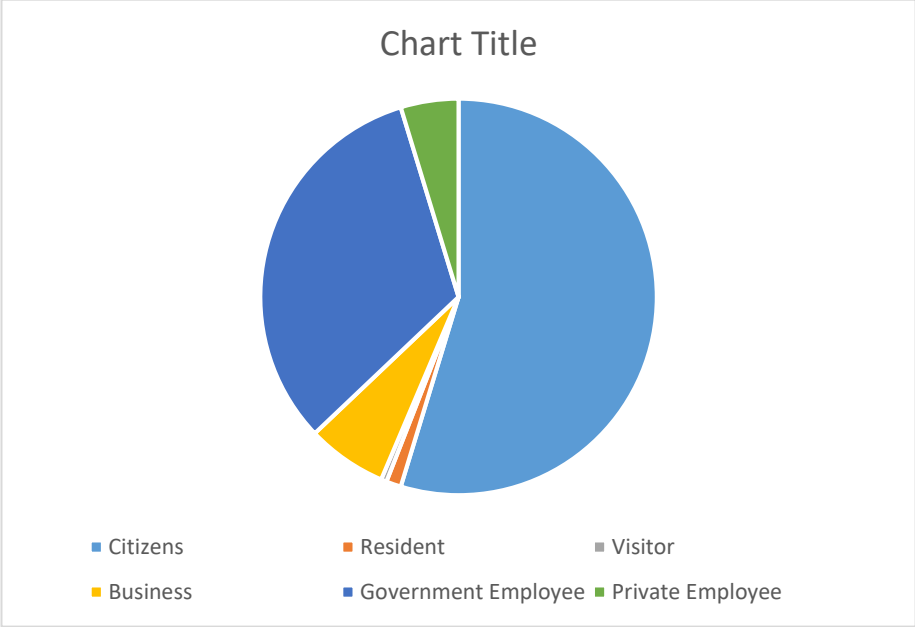

Figure 7-2 Oman data collected

Figure 7.2 above illustrates the participants distributed on the Oman users' class, where the dark blue circles represent the number of citizens' participants and the red represent the number of residents. The light blue represents the number of government users and green the number of private users.

7.9.3. Sample description

The questionnaire was conducted during (45 questions). The hypothesis consists of (questions that were also built according to the model built. The response rate for this questionnaire is 71.5%. The approximated distributed number majorities of studies accept this percentage. While the general accept response rate is around 64.4 percent to 48.4 percent (Baruch and Holtom 2008).

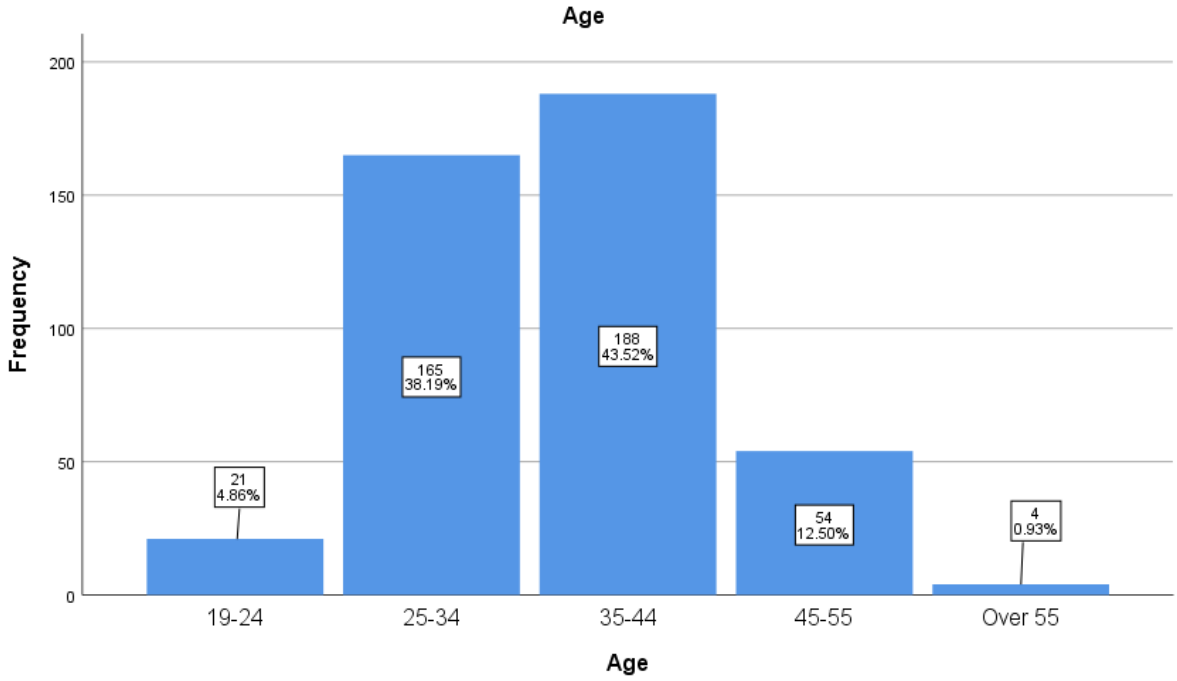

Figure 7-3 The Percentage of respondents according to age groups

According to the survey results, the majority of responses belongs to age group 35-44 and 25-34, these age groups represent 43.52% and 38.19 % respectively. In contrast, the minority of age group were from above 55 years old. Only 12.5 % were from 45 to 55 years old, in this sense this study agreed with another study conducted by (Klovning et al. 2009).

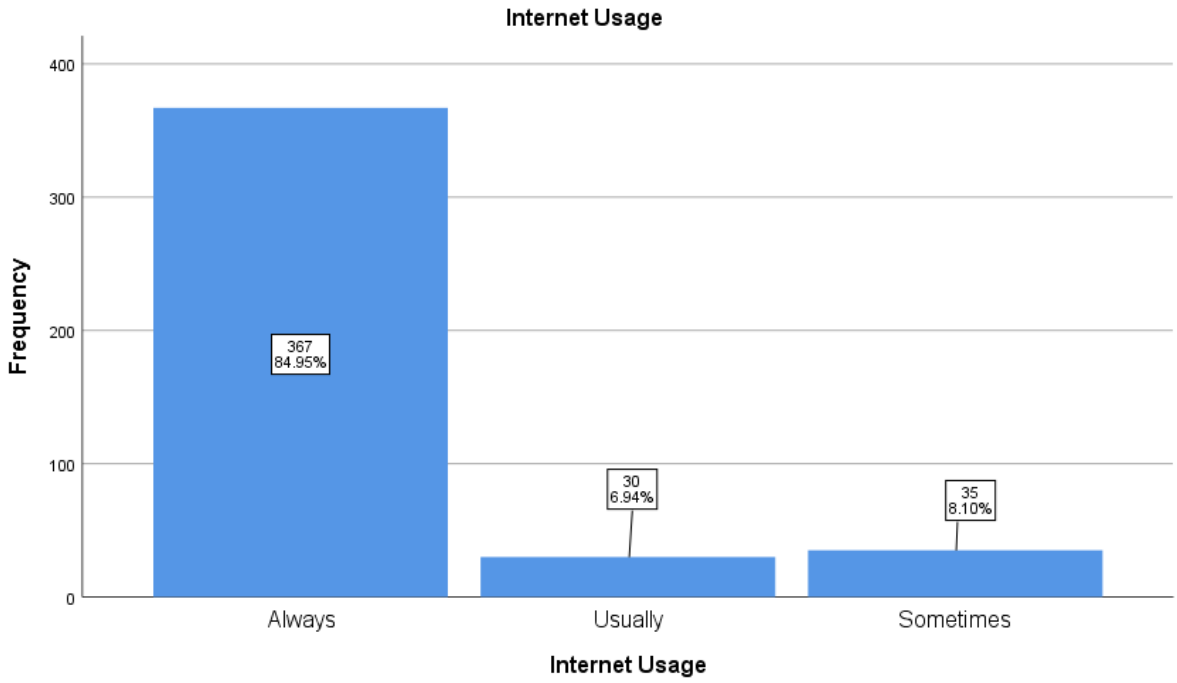

Figure 7-4 Number of internet usage according to the survey

There were 367 of the respondents are always using the internet, and only 30 respondents used the internet. The potential of this equation is to address the pattern of users is also addressed by several scholars in order to tackle the utilitarian of internet availability (Schaefer and Dillman 1998). This will also might enhance the decision makers that results in the greatest amount of good for all stakeholder groups and the maximum amount of happiness for the greatest number of people.

Figure 7.5 indicated the number of government institutes that respondents used. The majority of respondents used Royal Oman Police (ROP) service that is 73.6%, however, 2.5 % the minor percentage were using ministry of heritage and culture (MOHC). This might be indicated that there are few respondents or few services offered by this institute. In contrast, two ministries

ministry of education (MOE) and ministry of manpower (MOM) offered e-services respondents above 44% percentage. The remaining government bodies indicated that the majority of the respondents were around the range of 35-16%. They are ministry of higher education (MOHE), ministry of civil services (MOCS), ministry of health (MOH1), Information technology authority (ITA), and ministry of housing (MOH). Other institutes were counted for merely 13% except for ministry of endowment and religious affairs (MOERA).

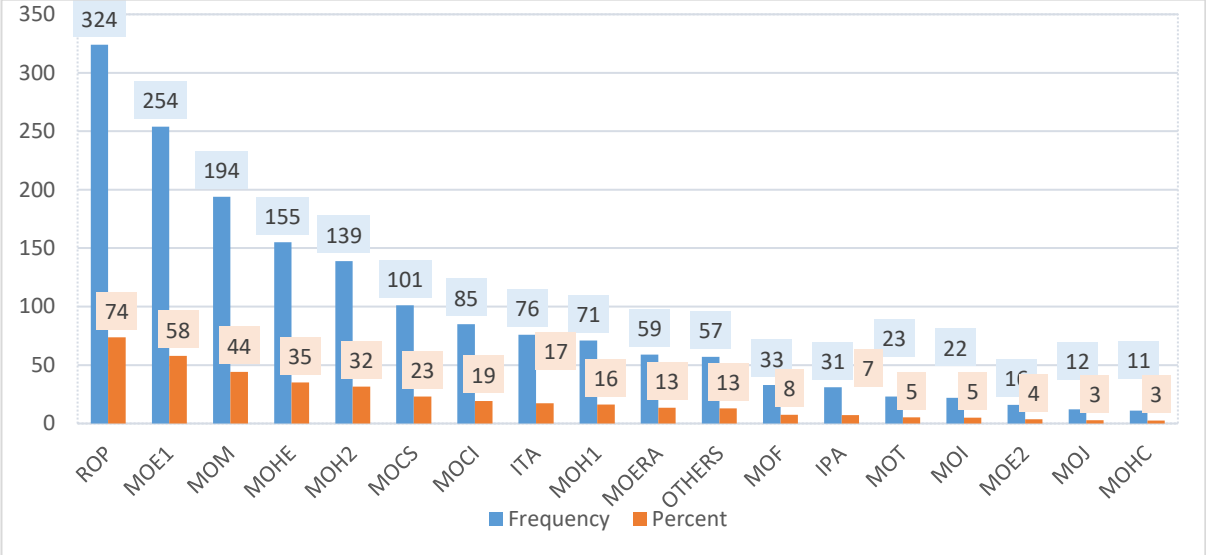

Figure 7-5 The distribution of the Government institutes used by the respondents

Table 7-16 Government Bodies that were included in the questionnaire

No	Abbreviation	Ministry Bodies
1	ROP	Royal Oman Police
2	MOE1	Ministry of Education
3	MOM	Ministry of Manpower

4	**MOF**	**Ministry of Finance**
5	**MOT**	**Ministry of Tourism**
6	**MOHE**	**Ministry of Higher Education**
7	**IPA**	**Institution of Public Administration**
8	**MOH1**	**Ministry of Health**
9	**MOH2**	**Ministry of Housing**
10	**ITA**	**Information Technology Authority**
11	**MOCS**	**Ministry of Civil Services**
12	**MOE2**	**Ministry of Environment**
13	**MOJ**	**Ministry of Justice**
14	**MOCI**	**Ministry of Commerce and Industry**
15	**MOI**	**Ministry of Inertial**
16	**MOHC**	**Ministry of Heritage & Culture**
17	**MOERA**	**Ministry of Endowment and Religious Affairs**
18	**OTHERS**	**OTHERS**

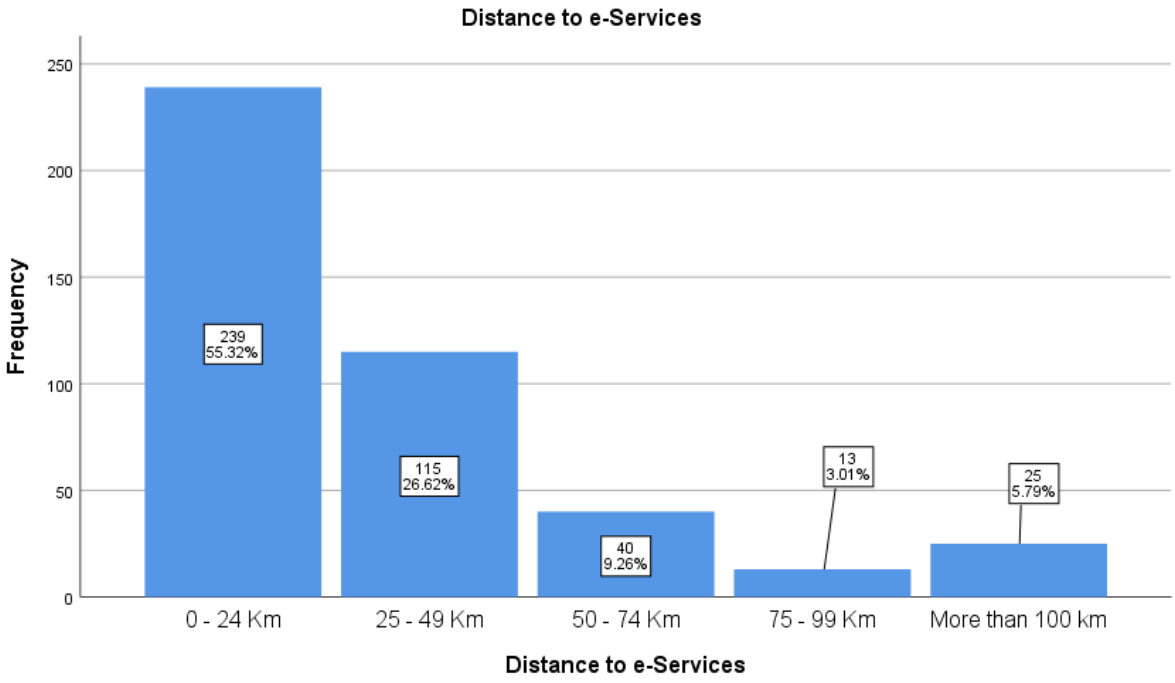

Figure 7-6 Distance to e-Services

The figure 7.6 above indicated that the minimum distance preferred by survey responders is 0-24 kilometres, this equals 239 responder answers. While more than, 100 km is preferred by only 25 of the responders. This indicates that 0-24 km is the most accepted distance of e-services. According to responders, 25-49 km is counted for moderate preference.

Considering the time scale for accomplishing the e-services indicated that the maximum acceptable time to handle an e-service is 5 minutes. Majority of responders are expecting no more than 16 minutes for one service. The moderate time scale accepted by responders is around half an hour. This time is also measure by (Mou et al. 2017).

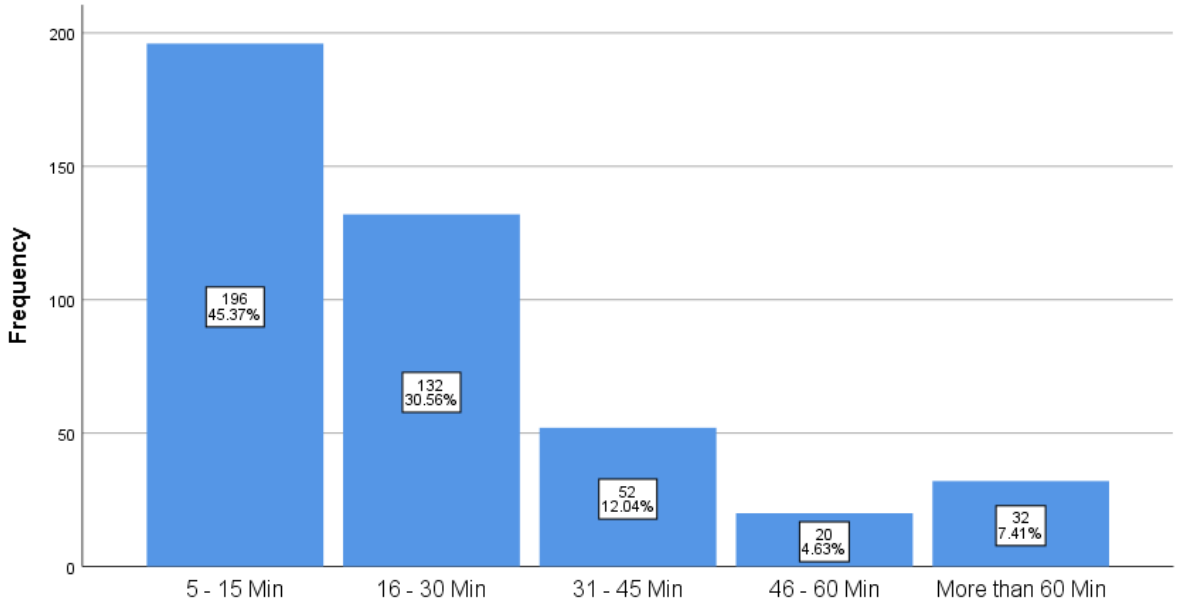

Figure 7-7 The expected minimum time to finish the e-government services

7.9.4. Correlation Analysis

In order to explore the potential relationship between factors and e-government services, The Pearson Chi-Square statistic test was conducted in SPSS. This test is important to verify the type of correlation between factors and e-government services level. Below the threshold ($p < .05$) is important. Therefore, it was necessary to use non-parametric test data analysis.

To further explore the impact of the groups (gender, citizen's users and government users) at the level of e-government implementation institutions, the chi-square test was conducted where data for each variable were left largely out of normal.

7.9.5. Chi-Square test

Further analysis was undertaken to explore whether there were any differences between government services of institutions with the eleven factors in terms of acceptance of using e-government services. Therefore, the chi-square test was run in SPSS. This test helps to explore the role of unifying electronic services in the behavioural intention to accept using e-government services.

7.10 *Findings and discussion*

The e-government in Oman is geared towards providing public services to citizens. Oman has undergone e-government changes since 2003. Since then, according to UN e-government reports, some e-services are still incomplete and not yet available citizens.

It is clear that the trust factor had a great impact in encouraging e-government institutions to expand their e-government services through the commitment of official bodies to reduce long travel distances and provide better access to e-services such services have the ability to be used with ease and can succeed. Therefore, trust can be considered as a backbone of any e-services project. The higher the confidence, which comes from legitimacy, enjoys formal institutions support, and therefore less dependence on other means (Nixon et al. 2017).

There were a significant number of citizens who had participate in improving e-government services. Several findings can be drawn from the discussion of the proposed model.

1. Behavioural Intention to accept using e-government services that driven by main factors which are significantly related to each other. These factors are security, trust, performance expectancy, effort expectancy, social influence, facilitating conditions, quality, usability, web design and content.

2. Security and behavioural intention are positively related to each other. This is also approved by (Taherdoost 2017; Taherdoost 2018).

3. Trust is the willingness of the individual to accept positive expectations about the intentions or behaviour of another person in a situation of interdependence and risk (Ennew and Sekhon 2007). When reviewing the literature on acceptance of using e-government, trust was found to be a major indicator of behavioural intentions e.g (Luo et al. 2010; Kim 2011; Venkatesh et al. 2012; Sarkar et al. 2016). Carter and Bélanger found that the compatibility of trust had direct and positive relationships with the behavioural intention of using e-government services (Carter and Bélanger 2005). Citizens' trust leads to the adoption and use of e-services provided by governments. Trust in government is an important factor in the initiative of using e-government services. Thus, without such relationship, there will be a flaw in implementation of the services.

4. Performance Expectancy was used to explore the expected performance and potential benefits of using e-government services being the degree to which the use of technology provides benefits to consumers in performing certain activities. (Venkatesh et al., 2012).

5. Effort Expectancy was included to investigate beneficiaries' beliefs about whether the use of e-government services is stressful and to predict their behavioural intention to use e-government services. It is expected that if beneficiaries find e-government services easy to use, they are likely to utilise these services as the degree of ease is associated with consumer use of technology (Venkatesh et al., 2012).

6. Social influence is "the extent to which consumers believe that important others think they should use a particular technology" (Venkatesh et al., 2012: 159). Social influence may affect an individual's perceptions and behaviours to participate in a particular work (Venkatesh et al., 2003). The direct impact on Behavioural Intention is the fact that people may be influenced by the opinions of others and therefore will participate in the use of certain behaviour even if they do not want to.

7. As the influence of quality on acceptance decisions of users has received limited attention, this research contributes to acceptance theory with consideration of proposing a model that puts the spotlight on the influence of quality on end-user intention to use e-services and consequently e-service acceptance. Raising the quality of the services

provided electronically will help organisations achieve their goal of customers accepting the e-government services (Chang et al. 2015). In a competitive business environment, it is significant to understand customers' needs and deliver a high quality of service to encourage customers to accept e-government services (Suki 2014).

8. The price value has a positive effect on behavioural intention (Venkatesh et al., 2012). Citizens who use non-electronic government services will have to physically visit government offices, fill applications by hand and make several trips according to their service needs. Thus, we re-examine the price value between the benefits of using e-government service and the cash cost (travel expenses) of using traditional government offices. Using e-government instead of traditional government offices is expected to lead to savings to citizens. The Chong and Ngai (2013) study found an important positive relationship between price value and behavioural intention in the context of site-based social media. Regarding information technology, Venkatesh et al. (2012) explain that the value of price is closely related to the behavioural intention.

9. Usability is an important factor for any website. Access to local government sites has been investigated by the Cabinet Office of the United Kingdom (2005). Moreover, the author asserts that usability criteria must be in place to provide equal access to every citizen.

10. Website design and information quality also affect the adoption of e-government services. Oman e-government websites are still at the static phase and government authorities should rethink their e-government website design as it has been found to be significantly related to their intention to use e-government services (Al Salmi et al. 2016). Websites should have a simplified design to make their use as easy as possible, bugs should be removed, that because users may refrain from using electronic services if the Web site is complex and incorrectly designed and the information is not updated periodically, thus making it difficult to use.

11. Content is the key to the success of any portal and therefore the information must be adequate and clear to the user. The most problems in developing countries portals are due to bureaucratic process and obstacles that lead to social clashes or delay in providing services to citizens in a transparent manner (Chander and Kush 2012).

12. Citizens trust these institutions' departments based on their commitment and try their best to utilise these services by all available means. From the above results it is noticeable that the trust in e-services latent variable were recorded as the most significant values in both results. It has been found that is an essential factor (Smith 2010; Wang and Lo 2013; Aladwani 2013; Porumbescu 2016; Lallmahomed et al. 2017) in adoption and implementation of e-government. This

indicates that trust plays a vital role in the implementation of e-government services.

7.11 *The unified approach framework of e-government services*

The bellow table 7.17 shows a clear result in the relationship between the factors of unified e-government services and the behavioural intention of user acceptance to use e-government services and between the factors of e-government services and behavioural intention of user acceptance to use e-government services.

There was an increase in the behavioural intention acceptance of using the proposed unified e-government services in access of 14.12%. There was an increase of 30.43% in security. In addition, for web design there was an increase of 54.67%. In social influence, there was a massive increase more than 100%, and in facilitating condition there was an increase of 88.51%. In cost value and content there were increase in 12.06% and 38.43% sequentially.

Table 7-17 the difference of user's acceptance to use e-government services with Unified Approach

	Citizen Users	Citizen Users (Unified Approach)
Usability	262	299
Security	253	330

Trust	358	262
Web Design	214	331
Social Influence	122	267
Facilitating Condition	174	328
Quality	250	187
Cost Value	282	316
Content	216	299

The research framework is modified accordingly to reflect the findings of the qualitative and quantitative data of the current study in order to explore the effectiveness of unified approach and behavioural intention towards using e-government services. It is named; User Acceptance of using e-Government Services, Impact of Unified Approach Framework on The Government Cloud. Figure 7.8 below shows the interrelationship between the findings from the quantitative and qualitative methods and the behavioural intention to accept using unified e-government services that was identified in this study. This study found that there was a strong relationship between the effectiveness of unified approach and the behavioural intention to accept using e-government services. The contribution of the current study is to show how the proposed effectiveness unified approach affects the behavioural intention to accept using e-government services.

This study found nine factors, namely usability, security, trust, web design, social influence, facilitating conditions, quality, cost value and contents, in the Omani public sector institutions which had significant impacts as illustrated in

figure 7.8 (Box A). Moreover, each type of the unified approach factors had different impacts on emergent themes from the qualitative data, which illustrated in below Figure 7.8 (Box B) which then have affected the behavioural intention to accept using e-government services. The impact of each factors of the unified approach on the behavioural intention to accept using e-government services was discussed in detail previously in this chapter. However, this framework presents a clear understanding of the relationship between unified approach and behavioural intention to accept using e-government services and this could be further investigated in future studies upon implementation.

This study concluded that public sector institutions in Oman have to consider some (if not all) of the issues related to their factors of unified approach in their institutions in order to improve the user acceptance to use e-government services.

Moreover, policy makers need to be aware of the impact on user acceptance of e-government services, which may result in making frequent changes to e-services. In general, factors of effectiveness of unified approach were found to have strong relation in improving the use of e-government services.

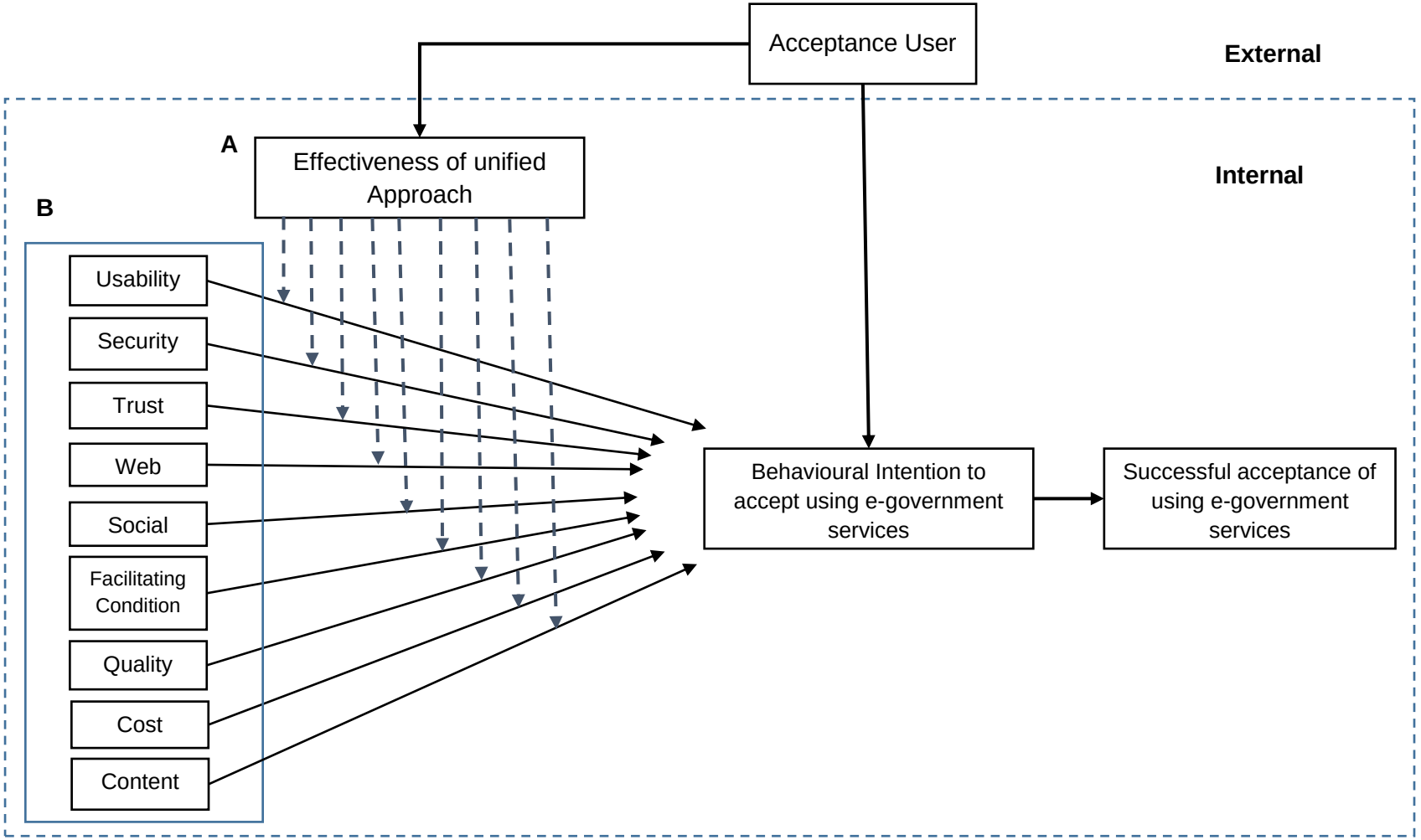

Figure 7-8 User acceptance of using e-government services, Impact of unified approach framework on the government cloud

7.12 *How to implement the proposed framework*

To implement this Framework, action need to be undertaken at number of levels and by all the relevant sectors. From the framework shown in figure 7-8 the Implementation relays on the following basic steps:

1. Government institutions represented by the existing government departments, bodies should conduct planning and prioritise the services which are urgently needed to be implemented.

2. By clearly posting information on websites, citizens will be encouraged to accept e-government services.

3. It is the responsibility of government institutions to cooperate with each other to integrate e-services and encourage citizens to use these services.

4. Setting up a feedback system to capture the user acceptance and filling gaps upon implementation.

5. Engagement and imposing to all government institutions to use the proposed approach and their success.

7.13 *The framework in summary*

Based on the above findings and discussions, there is an opportunity to consolidate official e-government services using e-government initiatives. In the figure 7.8 above, the relationship between government institutions can be

further integrated through the implementation of e-government services and encourage citizens to use them.

The role of government institutions is to control and integrate government services among themselves and work to maintain the improvement of services so that all can finish all transactions through websites without the need to visit offices. E-government services can be applied as a tool to encourage each government institution to work together to provide services to citizens by formulating the framework based on the following points, noting that the starting point is always government institutions represented by departments and organisations within government bodies:

1. Government institutions are those relevant departments that take e-government service implementation initiatives.

2. Government institutions shall provide public services to all citizens and clarify the safety cases that citizens will receive during their electronic procedures.

3. There is an opportunity to increase confidence among citizens in e-services by encouraging e-government institutions to expand their e-services in order to reduce long-distance travel for e-government services.

4. Government institutions should improve content where the addresses are clear and understandable enough for citizens and provide the

accuracy of all information provided on the websites in order to meet the needs of users.

5. The e-government services should enjoy quick and easy access and raise performance to improve the quality of work to complete the completion of transactions significantly.

6. Citizens get high quality for their use of e-government services.

7. Government institutions should design their websites to suit the expected user needs and display information correctly and appealing.

8. Social impact will affect the use of e-government services from people around them.

9. Value of money is an essential element of any behavioural intention to accept the use of e-government services to win a large number of users.

7.14 *Conclusion*

This chapter describes the main findings of the survey conducted for the purpose of this academic study. The results showed a statistically significant relationship between the level of consolidation of e-government services and behavioural intention to accept using e-government services that to verify these links Chi-Square test were used. The consolidation of e-government services had a significant impact on improving e-government services, and acceptance of using e-government services. Moreover, the results of this chapter showed user acceptance evaluation of e-government services, impact of unified approach framework on the government cloud and how factors has different effects on the consolidation of e-government services.

In addition, this chapter discussed the analysed of the research model accurately and proposed the results in a framework. The results of the analysis have helped to understand why e-government services have been standardised in Oman. The proposed framework may assist existing institutions to advance the experience gained from the implementation of e-government unified in order to implement and expand e-Services.

This study has an impact on the use of the criteria used in the classification of the United Nations e-government to improve the use of e-services by raising the indicators used in the Online Services Index (OSI) in terms of integrating the provision of online services, providing services related to users to provide information, increase users to use of e-services through government data and government procurement, and electronic participation of citizens through

government services provided. The proposed unified approach has an impact on acceptance of e-government services through the results described in this study where there was an increase of 12% to accept the use of unified services for non-unified services This indicates that the unified services have a positive impact directly on the individual and the government to use e-government services. The proposed unified approach will help the government to deploy its e-services in a clear and integrated format for citizens and will therefore affect the rate of user acceptance, which will reduce users from physically personal presence to government services.

Chapter 8: Conclusion and Future Work

8.1 *Conclusion*

This is a conceptual study to evaluate the user acceptance of using e-government services, impact of unified approach on the government cloud. This proposed framework is therefore used for testing the acceptability of e-services. In depth literature review of related research is used to consider the improvement of e-government services and their adoption in Omani government.

This study was conducted to fill the gap of previous studies related to the work of a unified framework that serves developing countries in particular. Therefore, this study is considered to add value to the knowledge group and the e-government implementation in this context.

8.2 *Research contributions*

To achieve the research aims and to provide theoretical insights into the implementation and use of e-government services and related institutional and cultural aspects, several Omani public sector organisations were used in semi structured interviewed.

From this study, it was concluded that the user acceptance of e-government services is not only about the use of technology but involves the behavioural intention which contain to several factors such as; trust, security, performance

expectancy, effort expectancy, social influence, facilitating conditions, quality, cost value, usability, web design and content aspects.

Gaining Knowledge of these areas led to an exploration and examination of these aspects, particularly relation between the user acceptance and success factors of the unified approach of e-services adoption and diffusion. Institutional theory and factors provided real-life evidence of how important these aspects are in the success (or failure) of e-government services initiatives. There are many gaps in the research of e-government generally and within the GCC. This is true of research on unified e-government services users' acceptance, due to its novelty and its rapidly changing place within society and organisations alike (Boyd & Ellison, 2010; Mergel, 2013a).

It has aroused this research study raised many points and contributions, so this study will contribute to knowledge in the following ways:

1. A framework formulated from this study can be adopted to reduce the effort in developing a unified work that will help Oman and the UN member's states to use this framework to improve their e-services to implement e-government success initiatives.

2. The success factors emanating from this study added a knowledge value related to the improvement of e-government services that encourages the government in general and citizens in particular to rely on the use of e-services instead of going to end their transactions manually.

3. Use a common and unified regulatory platform between government institutions to ensure the integration of electronic services by supporting institutions to provide their services and create some incentives for citizens such as reducing transaction fees and the speed of termination.

This study should be beneficial as it will bridge gaps in the literature and provide a new, real-life perspective for the use of e-government services/user acceptance in developing countries public sector organisations. This study has also developed a framework that is based on the current literature and the interpretive findings from the final case studies, to offer evidence and narrow the gap between e-government services and user acceptance.

It is clear that the use of e-government services is the right direction that led to the establishment of more efficient and effective services that proved their importance. The Omani citizens asserted that they are ready to use the e-services unless the services provided were improved like developed countries.

The interpretive approach, which this study used along with data (interviews and questionnaire), helped provide depth and richness to the study. Further, the use of in-depth interviews as the research data collection technique was considered important for this type of research in Oman because it allowed face-to-face contact that was important for this interpretive study particularly with the majority of participants being involved in a research study for the first time. Therefore, the use of qualitative research was also important to allow for a deeper understanding and probing of this phenomenon.

8.3 *Research Limitations and Future Directions*

This research study leads the way for further studies in the context of improving e-government services in countries that wish to improve and upgrade their services and increase their ranking in the United Nations' list. In this section, suggestions are made for a possible continuation of the work presented in this research. Each of the following points can be applied as a topic for further research in itself.

In this thesis, group of service organisations have been taken as an example of improving and using e-government service, these are mandatory services as service institutions. This could be due to the nature of their work, which involved providing direct services to the public. Future research could examine different types of Oman public organisations that may not have direct links with the public, as well as the use of e-government services in private organisations. This study has focused on unified e-government services users' acceptance, but future research could benefit and be extended by including other stakeholders such as the public and other government organisations.

This study also used the mixed methods approach and case study technique as it was believed that these were the best ways to fulfil the exploratory nature of this study. Future researchers could experiment with other research approaches and methods, such as conducting a longitudinal study having comparative studies and action research.

E-government is a relatively new and fast-moving topic particularly with the introduction of unified e-government services users' acceptance by many governments in developing countries. Many areas of e-government services / users' acceptance still need to be studied. Future research should develop the understanding and knowledge related to these fields beyond the scope of this research.

The development of the research framework was based on government institutions in Oman as a case study. Therefore, this framework should be validated in a different context to extend its generalisability and contribution.

An important context is also exploring citizen perception of e- government services /user acceptance. This is an important area to investigate in order to explore citizen perceptions with respect to the implementation of e-government services by government organisations.

8.4 *Research Recommendation*

This research is based on a developing country, Oman, and particularly public sector e-government services development. There are lessons that can be learned, and recommended as follows:

This research explored the use of e-government services and user acceptance focused on adoption and institutional within organisational contexts. These factors need to be considered when new technology is implemented in order to increase a project's acceptance and reduce employee resistance.

The majority of participants indicated there is a lack of standardisation in e-services and not clear guidance prior to the implementation of e-government services. This suggests that there is a need for national e-government services in order to avoid the duplication of services that most government organisations undertake when implementing e-services.

With the popularity of using e-government services among Omani individuals increasing on a daily basis government organisation are no longer the only players in the market when developing policies and taking decisions, particularly with respect to public services. It is essential for government organisations to increase public participation, as one of the main stockholders, and to attend to citizens' opinions and concerns in order to avoid public criticism and improve public services. Therefore, citizen involvement in some decisions that relate to public services is essential.

Other factors that need to be addressed in e-government services research are ethical issues when attending to matters such as e-government services privacy and security. Privacy and security must be examined in order to develop a policy or guidelines for citizens and government employees using e-government services and to increase public awareness about posting personal data on e-services.

Chapter 9: References

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Appendix A: Semi-structured Interviewed Consent Form and Questions

Consent form

I am a PhD student at University of Bradford in the UK. I would like to conduct a study on enhancing in the services delivery level from government to citizens as well as raising the Sultanate of Oman's classification in United Nations report on e-government. I would like to ask you kindly to participate to this scientific study through an interview and from that, I will take notes; the interview does not take more than 45 minutes. If you do not mind, I am going to have the registration of the interview that these recordings are strictly confidential and it will be used for academic purposes only. The main purpose of this interview is to enrich my research with real data.

Thank you very much for your cooperation

انا طالب دكتوراه في جامعه برادفورد بالمملكه المتحدة. أود إجراء دراسه حول تحسين مستوى تقديم الخدمات الحكومية الالكترونية للمواطنيين وكذلك رفع تصنيف سلطنة عمان لدى تقرير الامم المتحدة للحكومات الالكترونية. عليه ارجو التكرم بالمشاركة في هذه الدراسة العلميه عن طريق اجراء مقابله ويتم من خلالها تدوين الملاحظات، على ان لا تستغرق المقابله اكثر من ٤٥ دقيقة. ان لم يكن لديكم مانع ساقوم بتسجيل المقابله على ان تكون هذه التسجيلات في غاية السريه وسوف تستخدم لاغراض اكاديمية فقط، حيث ان الهدف الاساسي من المقابله هو اثراء رسالتي ببيانات حقيقية.

شكرا جزيلا على تعاونكم

I agree to take part in the interview (Yes) (No)	اوافق على المشاركه في المقابله (نعم) (لا)
I agree to be recorded (Yes) (No)	اوافق بتسجيل المقابله (نعم) (لا)

اسئلة المقابلات

1. ما هي معايير سهوله التصفح المتوفرة لدى موقعكم الالكتروني؟
2. هل يوجد لدى موقعكم اكثر من لغة؟ ان وجد ما هي؟
3. هل موقعكم الالكتروني تم انشاءه على حسب التصنيف الدولي للأمم المتحدة؟
4. هل تعتقدون بان توحيد منهجية الخدمات الحكومية لدى المواقع الالكترونية الدولية ستؤثر ايجابيا على قبول وزيادة عدد مستخدمي الخدمات الحكومية الالكترونية للبوابة الرسمية العمانية ؟
5. هل يوجد لدى موقعكم الالكتروني خانه للاقتراحات والشكاوى والملاحظات؟
6. هل يوجد لدى موقعكم الالكتروني دردشة الكترونية للتعامل في حل المشاكل بأسرع وقت ممكن؟
7. هل تم تفعيل التوقيع الالكتروني لدى موقعكم الالكتروني؟ ان وجد ماهي الشركات المعتمدة والمرخصة دوليا؟
8. هل تم تفعيل الدفع الالكتروني لدى موقعكم الالكتروني لجميع الخدمات الحكومية؟
9. بعض الاجراءات تتم عن طريق عدة مراحل ومن عدة وزارات او مؤسسات حكومية وقد تستغرق عدة شهور،
    a. هل قامت وزارتكم بربط ودمج وتسهيل وتحسين وتسريع هذه الاجراءات الخدمية الالكترونية؟
    b. هل يوجد نظام لدى موقعكم الالكتروني يحتسب وقت فترة انجاز المعاملات؟
    c. هل قامت وزارتكم بوضع خطة او فترة زمنية للخدمات الالكترونية المشتركة؟
10. ما هي الخطة القادمة لتحسين الموقع الالكتروني ليحظى على المراتب العليا في تقرير الامم المتحدة؟

11. كيف نرفع نسبة قبول مستخدمي الخدمات الحكومية الالكترونية ؟

12. لماذا الدول المتقدمة تتصدر اوائل قائمة تقرير الامم المتحدة للحكومات الالكترونية؟

13. هل تشجعون بان يكون هناك منصة الكترونية مشتركة (G Cloud) للخدمات الحكومية تقوم بتفادي اي ضغط على الشبكة في اوقات الذروة؟

14. هل لديك اي ملاحظات اخرى؟

Interview Questions

Q1. What measure do you have in place to access your web site?
Q2. Do you provide services in multiple languages? If so, what are they?
Q3. Did you setup your web site in accordance to the International Classification of the UN?
Q4. Do you thing that a unified International digital government approach of government services will have positive impact on the user acceptance of the Omani portal of its e-government services?
Q5. Do you provide and consider user feedback and process of complaints?
Q6. Does your site provides electronic chat service?
Q7. Has electronic signature been activated on your website? If so, what approved companies and international licensing authorities are you dealing with?
Q8. Does electronic payment fully implemented by your website and for all government services?
Q9. Some service actions can take months going through several stages and several ministries or government:
    a. Do you consider your ministry to be successfully integrated with other services so that it can facilitate, improve and speed up the electronic service procedures?

b. Could your Web site calculates process times?
c. Is there a place by which you address the ministry will joint electronic services?

Q10. What future plans do you have in place that could help in raising the profile and achieve better ranking of the UN report?

Q11. What plans do you have in place that could increase the number of e-government services users?

Q12. Why do you think that developed countries are at the top the list of the United Nation's e-government report?

Q13. Do you encourage a common e-platform (G Cloud) for government services that avoids any pressure on the network in peak times?

Q14. Do you have any other comments?

Appendix B: Questionnaire

عزيزي المشارك

أود أن أشكركم على مشاركتكم في هذا الاستطلاع المهم حول تأثير الخدمات الإلكترونية الموحدة على السحابة الحكومية، عمان كدراسة حالة. تعتبر مشاركتكم قيّمة لجميع المؤسسات الحكومية التي تهدف إلى تحسين وتطوير خدماتها الحكومية الإلكترونية. وهذا الاستبيان هو جزء من تحقيق متطلبات درجة الدكتوراه في علوم الكمبيوتر وسيستغرق استكمال الاستبيان التالي حوالى 12 دقيقة.

المشاركة في هذا البحث متروك لكم حيث ستظل جميع الإجابات سرية مما ستتم إزالة أي مواد تعريفية لضمان عدم الكشف عن هويتك، لن يتم توثيق أي إجابات فردية، وسيتم تحليل نتائج المجموعة أو عرضها فقط . إذا كنت غير راغب في المشاركة فأختر (لا) او أختر (نعم) لموافقتك على المشاركة في هذا البحث ومع ذلك، فلا يزال لديك الحرية في الانسحاب في أي وقت دون إبداء سبب قبل التقديم النهائي. يرجى تقديم رأيكم بصراحة، حيث أنه سيكون ذا قيمة عالية لكل من الباحث وجميع المؤسسات الحكومية، لتحسين خدماتها الحكومية الالكترونية.

علماً بإنه تمت الموافقة الاخلاقية من قبل رئيس لجنة أخلاقيات البحوث في العلوم الطبية الحيوية والطبيعية والفيزيائية والصحية بجامعة برادفورد بالمملكة المتحدة بتاريخ 14 نوفمبر 2018م.

نشكركم على وقتكم الثمين للمشاركة في هذا البحث ،،،،،

النعمان بن محمد الشيدي
طالب دكتوراه علوم الكمبيوتر
جامعة برادفورد – المملكة المتحدة
a.n.m.alshaidy@bradford.ac.uk

هل ستشارك في الاستبيان

- ❑ نعم
- ❑ لا

الجزء الأول: البيانات الشخصية

1. الجنس

اختار مربع واحد
- ❑ ذكر
- ❑ انثى

2. العمر

اختار مربع واحد
- ❑ 19 - 24 سنة
- ❑ 25 - 34 سنة
- ❑ 35 - 44 سنة
- ❑ 45 - 55 سنة
- ❑ اكثر من 55 سنة

3. كم مرة تستخدم الإنترنت
اختار مربع واحد

- ❑ دائما
- ❑ عادة
- ❑ في بعض الأحيان
- ❑ أبدا

4. هل تعمل؟

اختار مربع واحد

- ❑ نعم
- ❑ لا

5. هل أنت مستخدم لخدمات الحكومة الإلكترونية؟
اختار مربع واحد

- ❑ نعم
- ❑ لا

6. اختر جميع المؤسسات التالية التي قمت باستخدام خدماتها الإلكترونية.

ضع علامة على أكثر من خيار واحد

- ❑ وزارة المالية
- ❑ وزارة التربية والتعليم
- ❑ وزارة التعليم العالي
- ❑ معهد الادارة العامة
- ❑ وزارة الصحة
- ❑ وزارة الاسكان
- ❑ وزارة القوى العاملة
- ❑ وزارة الخدمة المدنية
- ❑ وزارة البيئة والشؤون المناخية
- ❑ وزارة العدل
- ❑ وزارة التجارة والصناعة
- ❑ وزارة الداخلية
- ❑ شرطة عمان السلطانية
- ❑ وزارة التراث والثقافة
- ❑ وزارة الاوقاف والشؤون الدينية
- ❑ وزارة السياحة
- ❑ هيئة تقنية المعلومات
- ❑ اخرى

7. هل تعمل في احدى الوزارات او الهيئات المختارة السابقة؟
اختار مربع واحد
- ❑ نعم
- ❑ لا

8. استنادًا إلى طبيعة احتياجات الخدمة التي تحصل عليها من بوابات الحكومة الالكترونية ، إلى أي فئة من المستخدمين تنتمي إليها:

ممكن اختيار اكثر من مربع

- ❑ مواطن
- ❑ مقيم
- ❑ زائر
- ❑ اعمال خاصة
- ❑ موظف حكومي
- ❑ موظف قطاع خاص

9. الى أي مدى تعيش من أقرب خدمة حكومية؟
اختار مربع واحد

- ❑ قريب جدا
- ❑ اكثر من 25 كم
- ❑ اكثر من 50 كم
- ❑ اكثر من 75 كم
- ❑ اكثر من 100 كم

10. لدي الاستطاعة:

ممكن اختيار اكثر من مربع

- ❑ الوصول الى الانترنت من المنزل
- ❑ الوصول الى الانترنت من العمل
- ❑ الوصول الى الانترنت من مقهى الانترنت
- ❑ الوصول الى الانترنت من خلال الهواتف الذكية
- ❑ ليس لدي اي وصول للانترنت

11. أستخدم الحكومة الإلكترونية من خلال:

اختر مربع واحد

- ❑ الخادم (اجهزة الكمبيوتر)
- ❑ الحوسبة السحابية (الاجهزة الذكية & التطبيقات & المنصات)
- ❑ كل ما ذكر
- ❑ لا شيء

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
أ. الثقة

12. أشجع المؤسسات الحكومية الرسمية على توسيع خدمات الحكومة الإلكترونية
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

13. تستطيع الحكومة الإلكترونية تقليل مسافات السفر الطويلة للحصول على الخدمات الحكومية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

14. خدمات الحكومة الإلكترونية لديها القدرة على أداء الخدمات الموعودة

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ب. المحتوى

15. العناوين (مثل عناوين خدمات الحكومة الإلكترونية) غير مصاغة بوضوح وصفي ومفهوم
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

16. استخدام خدمات الحكومة الإلكترونية يوفر لي ما أطلبه

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

17. المعلومات التي تقدمها الخدمة الإلكترونية دقيقة
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق

- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

18. الخدمة الإلكترونية لا توفر محتوى المعلومات الذي يلبي احتياجاتي
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ج. سهولة الاستخدام (سرعة الخدمة)

19. أنجز مهامي أسهل وأسرع مع الخدمة الإلكترونية
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

20. استخدام خدمة الحكومة الإلكترونية يحسن من جودة العمل الذي أقوم به
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

21. الحد الأدنى من الوقت المتوقع لإنهاء خدمات الحكومة الإلكترونية
اختر مربع واحد

- ❑ 5 دقائق - 15 دقيقة
- ❑ 16 دقيقة - 30 دقيقة
- ❑ 31 دقيقة - 45 دقيقة
- ❑ 46 دقيقة - 60 دقيقة

- ❑ اكثر من 60 دقيقة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
د. الجودة

22. احصل على جودة ممتازة من الخدمات الحكومية الإلكترونية:
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

23. خدمة الحكومة الإلكترونية تعمل بشكل جيد للغاية من الناحية الفنية:
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
هـ. الأمن

24. توجد إجراءات وتدابير مناسبة تضعها مؤسسات الحكومة الإلكترونية لمنع فقدان البيانات بصورة غير مقصودة
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

25. عند استخدام خدمات الحكومة الإلكترونية ، أعتقد أنه يتم تنفيذ الإجراءات الإدارية والفنية المناسبة لحماية معلوماتي الشخصية
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

26. أعتقد أن معلوماتي السرية محفوظة

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
و. التصميم

27. لم يتم تنظيم المواقع الحكومية بشكل منطقي حسب حاجة المستخدم المتوقعة
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

28. أنا غير راض عن تصميم الخدمة الإلكترونية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

29. تعرض خدمات الحكومة الإلكترونية المعلومات بصورة جذابة

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ز. الأداء المتوقع:

30. أود استخدام خدمات الحكومة الإلكترونية في أي مكان:
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

31. استخدام خدمات الحكومة الإلكترونية سيجعل حياتي أسهل.
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ح. الجهد المتوقع

32. تفاعلي مع خدمات الحكومة الإلكترونية سيكون واضحًا ومفهومًا.

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

33. سيكون تشغيل خدمات الحكومة الإلكترونية سهلاً بالنسبة لي.

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ط. تسهيل الظروف

34. لدي المعرفة اللازمة لاستخدام خدمات الحكومة الإلكترونية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

35. يمكنني الحصول على مساعدة من الآخرين عندما أواجه صعوبات في استخدام خدمات الحكومة الإلكترونية

اختر مربع واحد
- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ي. التأثير الاجتماعي

36. يعتقد الأشخاص الذين يؤثرون علي أنه يجب علي استخدام خدمات الحكومة الإلكترونية.

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

37. معظم الأشخاص المحيطين بي يستخدمون خدمات الحكومة الإلكترونية.

اختر مربع واحد
- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ك. النية السلوكية

38. أفضل لي ان استخدم خدمات الحكومة الإلكترونية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

39. أنوي استخدام خدمات الحكومة الإلكترونية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثاني: العوامل المؤثرة لخدمات الحكومة الالكترونية
ل. قيمة التكلفة

40. أعتقد أن استخدام خدمات الحكومة الإلكترونية يقلل علي المصاريف المالية .

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

الجزء الثالث: تأثير النهج الموحد للخدمات الإلكترونية على السحابة الحكومية
أ. خدمات الحكومة الإلكترونية الموحدة

41. أعتقد أن إطار خدمات الحكومة الإلكترونية يختلف بين الدول مما يجعل من الصعب على الناس الوصول إلى الخدمات الإلكترونية

اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد

❑ لا أوافق
❑ لا أوافق بشدة

42. بشكل عام ، خدمات الحكومة الإلكترونية الموحدة:

اختر مربع واحد

		اوافق بشدة	اوافق	محايد	لا اوافق	لا اوافق بشدة
1	**يمكنني الحصول على مساعدة من الآخرين عندما أواجه صعوبات في استخدام خدمات الحكومة الإلكترونية**					
2	**امنة**					
3	**تصميم الويب مريح**					
4	**سهلة الاستخدام**					
5	**محتوى منظم بشكل جيد**					
6	**جودة المعلومات**					
7	**سوف تؤثر على التأثير الاجتماعي**					
8	**سيتم الوثوق بها لأنها ستكون نموذجًا قياسيًا لمعظم البلدان لنفس قائمة الخدمات**					
9	**تقلل من التكلفة المالية**					

الجزء الثالث: أثير النهج الموحد للخدمات الإلكترونية على السحابة الحكومية
ب. الحوسبة السحابية

43. الحوسبة السحابية هي مساحة آمنة لحفظ البيانات.
اختر مربع واحد

❑ أوافق بشدة
❑ أوافق
❑ محايد
❑ لا أوافق
❑ لا أوافق بشدة

44. أنا أثق باستخدام السحابة الحكومية.
اختر مربع واحد

❑ أوافق بشدة
❑ أوافق
❑ محايد

- ❑ لا أوافق
- ❑ لا أوافق بشدة

45. لدي المام ومعرفة حول الخدمات الحكومية الإلكترونية على الحوسبة السحابية.
اختر مربع واحد

- ❑ أوافق بشدة
- ❑ أوافق
- ❑ محايد
- ❑ لا أوافق
- ❑ لا أوافق بشدة

Dear participant,

I would like to thank you for your participation in taking part in this important survey about the impact of unified approach e-services on government cloud, Oman as case study. Your participation is valuable to all government institutions who are aiming to improve or to develop the electronic government services. This questionnaire is part of the fulfilment for my PhD degree in Computer Science.

The following questionnaire will take approximately 15 minutes to complete. Taking part in this research is up to each individual. All your answers will remain confidential and any identifying material will be removed in order to ensure your anonymity. Any individual answers will not be documented, only the group results will be analysed or presented. If you are unwilling to participate just choose (No). Your agreement to participate in this research is granted by clicking on the (Yes) button. However, you are still free to withdraw at any time without giving a reason before the final submission.

Please give your opinion frankly, as it will be of a high value for both the researcher and all government institutions, for the improvement of their digital government services Thank you for taking the time to read this information sheet and taking part in the research.

Al Noaman Mohamed Al Shaidy
PhD student Computer Science
School of Electrical Engineering and Computer Science
University of Bradford
Bradford, West Yorkshire, BD7 1DP
United Kingdom
a.n.m.alshaidy@bradford.ac.uk

Check all that apply.

❑ I Read and understand the information sheet.

Part 1: Biodata

1. Gender

Mark only one oval.
❑ Male
❑ Female

2. My age is within

Mark only one oval.
❑ 19 - 24
❑ 25 - 34
❑ 35 - 44
❑ 45 - 55
❑ Over 55

3. How often do use the Internet?

Mark only one oval.
❑ Always
❑ Usually
❑ Sometimes
❑ Never

4. Do you work?

❑ Yes
❑ No

5. Are you a user of e-government services?

❑ Yes
❑ No

6. Choose all of the following institutions that you have used their e-services.

Mark more than one option.

- ❑ Ministry of Finance
- ❑ Ministry of Education
- ❑ Ministry of Higher Education
- ❑ Institution of Public Administration
- ❑ Ministry of Health
- ❑ Ministry of Housing
- ❑ Ministry of Manpower
- ❑ Ministry of Civil Services
- ❑ Ministry of Environment
- ❑ Ministry of Justice
- ❑ Ministry of Commerce and Industry
- ❑ Ministry of Inertial
- ❑ Royal Omani Police
- ❑ Ministry of Heritage & Culture
- ❑ Ministry of Endowment and Religious Affairs
- ❑ Ministry of Tourism
- ❑ Information Technology Authority
- ❑ Other

7. Are you working in one of the chosen institution?

Mark only one oval.
- ❑ Yes
- ❑ No

8. Based on the nature of the service needs you are getting from the government portals, to which class of users do you belong

Mark more than one
- ❑ Citizen
- ❑ Resident
- ❑ Visitor
- ❑ Business
- ❑ Government employee
- ❑ Private employee

9. How far do you live from the closest government services?

Mark only one oval.

- ❑ Local
- ❑ + 25 Km
- ❑ + 50 Km
- ❑ + 75 Km
- ❑ +100 Km

10. I have the ability:

Mark more than one option.

- ❑ Internet access at home only
- ❑ Internet access at work only
- ❑ Internet access at Internet café only
- ❑ Internet access through mobile
- ❑ I have no access

11. I use e-government through:

Mark only one oval.

- ❑ Server (Computer)
- ❑ Cloud (Smart Devices & Applications & Platforms)
- ❑ Both server and cloud
- ❑ None of them

Part 2: Factors affecting e-government services
A. Trust

12. I encourage the formal government institutions to expand their e-government services

Mark only one oval.

- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

13. E-government can reduce travelling long distances to obtain government services

Mark only one oval.

- ❑ Strongly Agree
- ❑ Agree
- ❑ Neutral
- ❑ Disagree
- ❑ Strongly Disagree

14. E-government services have the ability to perform the promised services accurately

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Part 2: Factors affecting e-government services
B. Content

15. Headings (e.g. titles of e-government services) are not clearly phrased, descriptive and understandable

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

16. Using e-government services provide me what I require

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

17. The information provided by e-service is accurate

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

18. E-service not provides the information content which meets my needs

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Part 2: Factors affecting e-government services

C. Usability (Speed of service)

19. I accomplish my tasks easier and quicker with e-government services

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

20. Using e-government service improves the quality of work I do

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

21. The expected less time to finish the e-government services

Mark only one oval.
❑ 5 min – 15 min
❑ 16 min – 30 min
❑ 31 min – 45 min
❑ 46 min – 60 min
❑ More than 60 min

Part 2: Factors affecting e-government services

D. Quality

22. I get very good quality out of e-government services:

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

23. E-government service works very well technically

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Part 2: Factors affecting e-government services

E. Security

24. There is an appropriate procedures in e-government services to prevent accidental loss of data

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

25. When using e-government services, I believe that certain managerial and technical procedures are implemented to protect my personal information

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

26. I believe that my confidential information is kept secure

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Part 2: Factors affecting e-government services
F. Web Design

27. Government websites are not organised logically by anticipated user need

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

28. I am not satisfied with design of e-service

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

29. E-government services attractively display information

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

G. PE

30. I would use e-government services anyplace

Mark only one oval.

❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

31. Using e-government services will make my life easier.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

H. EE

32. My interaction with e-government services would be clear and understandable.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

33. Operate e-government services would be easy for me.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

I. FC

34. I have the necessary knowledge to use e-government services

Mark only one oval
❑ Strongly Agree

❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

35. I can get help from others when I have difficulties using e-government services

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

J. SI

36. People who influence me think that I should use e-government services.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

37. Most people surrounding with me use e-government services.

Mark only one oval.

❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

K. BI

38. I prefer to using e-government services

Mark only one oval.

❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

39. I intend to use e-government services

Mark only one oval.

❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

L. Cost value (CV):

40. I believe that using e-government services is a good value for money.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Part 3: Effectiveness of unified approach of e-government services:

A. Unified approach of e-government services

41. I think the framework of e-government services differs between countries making it difficult for people to access e-services

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

42. Overall, the unified e-government services:

Mark only one oval

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I can get help from others when I have difficulties using e-government services					
2	Secured					
3	Comfortable web design					
4	Easy to use					
5	Well organized content					
6	Information Quality					
7	will affect social impact					
8	Will be trusted as it will be a standard model for most countries for the same list of services					
9	Reduce the financial cost					

Part 3: Effectiveness of unified approach of e-government services:

A. Unified approach of e-government services

43. Cloud computing is a secure space for data preservation

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

44. I trust using the government cloud

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

45. I have knowledge and knowledge about e-government services on cloud computing.

Mark only one oval.
❑ Strongly Agree
❑ Agree
❑ Neutral
❑ Disagree
❑ Strongly Disagree

Appendix C: Initial study – Merge main and sub-components of e-government services of six countries portals.

E-Government Components Based on 6 International E-Government Portals (Republic of Korea, Australia, USA, UK, Estonia and Bahrain)
Benefits, Grants, Loans and Payment (Australia, Estonia, Korea, UK and USA e-government portal, 2016) **Benefits entitlement:** Includes when and how benefit payments are made, benefits calculators and benefit fraud (UK e-government portal, 2016) **Benefits for children and families:** Includes Child Trust Funds, childcare and the Sure Start Maternity Grant (Australia, UK e-government portal, 2016). Benefits: Learn about federal government programs, including unemployment benefits, and how to find which ones are available to you (USA e-government portal, 2016). **Careers, disability benefits, insurances and financial help:** Includes disability living allowance, career's allowance, employment, attendance and support allowance (Australia, UK e-government portal, 2016). **Death and benefits:** Includes Widowed Parent's Allowance, Bereavement Payment, and Funeral Payment (UK e-government portal, 2016). **Food Assistance:** Find out how to get help buying nutritious food for you and your family (Korea, USA e-government portal, 2016). **Grants and Loans:** Learn about government grants and loans for states and organisations. For help for individuals, please visit our Benefits page (Australia, USA e-government portal, 2016). **Heating and housing benefits:** Includes Winter Fuel Payment and Cold Weather Payment (UK e-government portal, 2016). **Indigenous** (Australia e-government portal, 201**6).** **Jobseeker's Allowance, low income benefits, Unemployment benefits and other help for the unemployment:** Includes Income Support, Budgeting Loans and Pension Credit and discover some of the programs and resources that can help if you lose your job (UK, USA e-government portal, 2016).

Programs and Benefits for Active Military: Learn more about assistance available to members of the military and their families (USA e-government portal, 2016).

Youth payments and services (Australia e-government portal, 2016)**.**

Services & Benefits (Estonia e-government portal, 2016)**.**

Birth, death, marriages, Childcare and family issues (Bahrain, Estonia, Korea, UK, and USA e-government portal,2016)

Certificates, Register offices, Changes of name or gender: Birth certificates, registering a death, marriage, family history and correcting certificates (Bahrain, UK e-government portal, 2016).

Child Benefit: Information about eligibility, claiming and when Child Benefit stops (UK e-government portal, 2016).

Child Care and Related Issues: Learn about child care and special child care circumstances and finding childcare, financial support for childcare and childcare for school-age children (UK, USA, e-government portal, 2016).

Death and Bereavement: Reporting a death, wills, probate and Inheritance Tax (Bahrain, UK, USA e-government portal, 2016).

Financial help if you have children: Includes help when having a baby or adopting, child benefit and tax credits, support for childcare (UK e-government portal, 2016).

Having a child, parenting, adoption, fostering and surrogacy: Legal rights, parental rights, child maintenance, fostering or adopting a child, including from abroad, and being a surrogate mother (UK e-government portal, 2016).

Lasting power of attorney, being in care and your financial affairs: Includes dealing with benefits, taxes and leaving care (UK e-government portal, 2016).

Marriage, civil partnership, divorce, separation and legal issues: Includes getting married abroad, decree absolutes and looking after children and Child maintenance and disagreements about parentage (Bahrain, Korea, UK, USA e-government portal, 2016).

Pregnancy and birth: Working, time off and financial support when you have a baby, registering a birth (UK, USA e-government portal, 2016).

Relationships and social issues (USA e-government portal, 2016).

Business, trade, industry and self-employed (Australia, Bahrain, Estonia, Korea, UK and USA e-government portal,2016)

BN for businesses: is a unique digit number that identifies your business to the government and community. (Australia, Korea e-government portal, 2016).

Business debt and bankruptcy: Includes bankruptcy, insolvency and recovering debt (UK e-government portal, 2016).

Business finance and support: Finding finance, business support, writing a business plan (UK, USA e-government portal, 2016).

Business premises and business rates: Includes leases, renting, planning permission, waste and appeals (UK e-government portal, 2016).

Business tax: Includes Corporation Tax, Capital Gains Tax, Construction Industry Scheme (CIS) and VAT, and E-Tax has drastically reduced the time spent by individuals and entrepreneurs on filing taxes (Estonia, UK e-government portal, 2016).

Businesses and Non-profits: Find help with starting and growing a business or non-profit (USA e-government portal, 2016).

Commercial Registration Services and license applications: Applying for licences for events and businesses (Bahrain, UK e-government portal, 2016).

Customs and Customs Clearing Services (Bahrain e-government portal, 2016).

Daily Price Index (Bahrain e-government portal, 2016).

Expenses and employee benefits: Includes company cars and paying tax on employee benefits (UK e-government portal, 2016).

Farming business: Health and safety, registering and licensing animals, compliance tools, rights and pay (UK e-government portal, 2016).

Food, catering and retail: Labelling and handling food, transporting, food safety (UK e-government portal, 2016).

Generating energy: Funding, regulations and guidance for energy providers and operators.

Imports and exports: Includes moving goods in the EU and commodity code (Australia, UK e-government portal, 2016).

Industrial Brand Leaders and Industrial Standards (Korea e-government portal, 2016).

Lease Contract Services (Bahrain e-government portal, 2016).

Levy Calculator (Bahrain e-government portal, 2016).

Manufacturing: Managing waste, health and safety, regulations (UK e-government portal, 2016).

Maritime vessels and work at sea: Includes health and safety on board, crew, registering vessels (UK e-government portal, 2016).

Materials and Products Assessment e-Services (Bahrain e-government portal, 2016).

Materials Testing Results (QC) (Bahrain e-government portal, 2016).

Open Market Capitalist Economy (Korea e-government portal, 2016).

Patents, trademarks, copyright and designs: Includes registering, protecting and applying for designs and patents (UK e-government portal, 2016).

Primary industry (Australia e-government portal, 2016).

Running a small business, nonprofit and limited companies: Includes registering, setting up, company accounts and tax returns (Australia, UK e-government portal, 2016).

Sale of goods and services and data protection: Includes regulations for online retailers, offering credit and Trading Standards (UK e-government portal, 2016).

Science and technology (Australia e-government portal, 2016).

Scientific research and development: Includes funding and support scheme guidance (UK e-government portal, 2016).

Selling your business and closing down: Stopping self-employment, winding up or liquidating a limited company (UK e-government portal, 2016).

Setting up: Includes self-employment and starting a business (UK e-government portal, 2016).

State e-Services Portal: A one-stop-shop for the hundreds of e-services offered by government institutions (Estonia e-government portal, 2016).

Tenders Services (Bahrain, Australia e-government portal, 2016).

Citizen, society and living in the (Country) (Bahrain, Estonia, UK and USA e-government portal, 2016)

Charities, volunteering and honours: Nominating someone for an honour, setting up a charity, community participation (UK e-government portal, 2016).

Citizenship: Becoming a citizen, Life in the country test and getting a passport (Bahrain, UK, USA e-government portal, 2016).

Digital Signature: Digital signature enables secure, legally-binding, electronic document signing (Estonia e-government portal, 2016).

E-Residency: A centralized, paperless system for issuing and handling medical prescriptions (Estonia e-government portal, 2016).

Living in the country, government and democracy: Petitioning the government, government statistics, national emergencies and terrorism (UK e-government portal, 2016).

Population Register: The state database for basic information about each person living in Estonia (Estonia e-government portal, 2016).

Voting and election: Register to vote, getting on the electoral register and voting by proxy (Estonia, UK and USA e-government portal, 2016).

Crime, Justice, Law, Public safety, Court and Legal issues (Australia, Bahrain, Estonia, Korea, UK, and USA e-government portal, 2016)

Complaints: Learn how to file complaints and complain more effectively to resolve common consumer problems (USA e-government portal, 2016).

Consumer protection (Australia e-government portal, 2016).

Courts, cases services, sentencing and tribunals: Attending courts, paying fines, appealing a sentence, jury service and tribunals (Bahrain, UK e-government portal, 2016).

Crime, Prisons and probation: Sentencing, probation, support for families of prisoners and learn about reporting crimes or criminals and find frequently requested information about prisons (UK, USA e-government portal, 2016).

Disability rights: Disability rights under the Equality Act 2010 (UK e-government portal, 2016).

E-Law: Allows public access to every piece of draft law that has been submitted since February 2003 (Korea, Estonia e-government portal, 2016).

E-Police: Revolutionizes police communication and coordination, maximising effective policing (Estonia e-government portal, 2016).

Federal Laws, legislature, judiciary and Regulations: Learn some of the basics about laws, regulations, and executive orders, and discover resources to find out more (Korea, USA e-government portal, 2016).

Formation of Regulation Cases (Bahrain e-government portal, 2016).

Issue of Notary Certificates (Bahrain e-government portal, 2016).

Online safety (Australia e-government portal, 2016).

Personal Legal Issues, Documents, and Family History: Get legal help, replace documents and learn about your family history (USA e-government portal, 2016).

Reporting crimes and getting compensation: Including criminal injuries compensation and reporting suspected crimes (UK e-government portal, 2016).

Rights (Australia e-government portal, 2016).

Scams and Frauds: Learn how to protect yourself from and respond to scams and frauds (Australia, USA e-government portal, 2016).

Travel Ban Services (Bahrain e-government portal, 2016).

Young people and the law: Includes legal rights, youth offending teams and crime prevention (UK e-government portal, 2016).

Your rights and the law: Includes being arrested, cautions, and discrimination and consumer rights (UK e-government portal, 2016).

Driving, transport, traffic and regional development (Australia, Bahrain, Estonia, and UK e-government portal, 2016)

Abnormal Load Permission (Bahrain e-government portal, 2016).

Appointment for Driving Training Class (Bahrain e-government portal, 2016).

Aviation (Australia e-government portal, 2016).

Disability equipment and transport: Includes Disabled Students Allowances, Blue Badge and disabled access (UK e-government portal, 2016).

Drivers of Lorries, buses and goods vehicles: Includes tests, health and safety, roadside checks and carrying loads (UK e-government portal, 2016).

Driving and transport businesses: Includes operating goods vehicles, employing drivers, driving licence checks and test stations (UK, USA e-government portal, 2016).

Driving licences: Includes driving licences and records, changing your address, fees and tracking your application (UK, USA e-government portal, 2016).

Driving tests, motorcycle tests and learning to drive: Booking, changing and cancelling practical and theory tests, fees and compulsory basic training (UK, USA e-government portal, 2016).

Driving with a disability or a health condition: Information about medical conditions that affect your ability to drive (UK e-government portal, 2016).

General Directorate of Traffic Services (Bahrain e-government portal, 2016).

MOT (Ministry of transport) and vehicle insurance: Includes getting an MOT, MOT fees and vehicle insurance (UK e-government portal, 2016).

M-Parking: Allows drivers to pay for city parking using a mobile phone (Estonia e-government portal, 2016).

Number plates, vehicle registration and licenses: Includes selling your vehicle, changing your address, personalised registration numbers and registering your vehicle (Australia, Bahrain, UK e-government portal, 2016).

Permit parking padge, parking, local travel and the environment: Information about parking permits, fines and wheel clamping (UK e-government portal, 2016).

Public Bus Schedule and Route Information (Bahrain e-government portal, 2016).

Regional development (Australia e-government portal, 2016).

Roads and transport (Australia e-government portal, 2016).

Teaching people to drive: Becoming an instructor, applying for licences, booking tests and rules (UK e-government portal, 2016).

The Highway Code: Includes road signs and rules for motorists and cyclists (UK e-government portal, 2016).

Traffic Signal Maintenance Request (Bahrain e-government portal, 2016).

Vehicle and boat safety: Includes disqualification, penalty points, vehicle recalls and registering boats (UK e-government portal, 2016).

Vehicle tax: Buying and renewing car tax, vehicle tax bands (Bahrain, UK e-government portal, 2016).

X-road (Estonia e-government portal, 2016).

Education, learning and training (Australia, Bahrain, Estonia, Korea, UK, and USA e-government portals, 2016).

Accreditation of Abroad Qualifications (Bahrain e-government portal, 2016).

Apprenticeships, 14 to 19 education and training for work: Includes finding a course, finding an apprenticeship, 16 to 19 Bursary Fund (UK e-government portal, 2016).

Early childhood (Australia e-government portal, 2016).

Education, Research, and Industry (Korea e-government portal, 2016).

Endorsement of Local Qualifications (Bahrain e-government portal, 2016).

E-School: Allow students, teachers and parents to collaborate in the learning process (Estonia, e-government portal, 2016).

How to Study in the country: Find out how you can visit the United States as a student (USA, e-government portal, 2016).

International students (Australia e-government portal, 2016).

Issuing Copies of Student Certificates (Bahrain e-government portal, 2016).

Libraries and Archives: Find public, state, and federal libraries (Bahrain, USA e-government portal, 2016).

Military Colleges and Academies: Learn about military schools and service academies, which train future officers, doctors, engineers and other military professionals (USA e-government portal, 2016).

Primary and Secondary Education: Find out where to get answers to common questions about primary and secondary education (USA e-government portal, 2016).

Qualifications and Quality Assurance Authority Services (Bahrain e-government portal, 2016).

Registration for Continuous Education Programs (Bahrain e-government portal, 2016).

Scholarships (Bahrain, Australia e-government portal, 2016).

School admissions and transport to school: Applying for a school place, home schooling and travel costs (Australia, UK e-government portal, 2016).

Schools, Colleges, Universities and higher education's directory: Finding courses, comparing qualifications and checking a university is recognised and find out where to get answers to common questions (Bahrain, UK, USA e-government portal, 2016).

Schools, curriculum and exam results: Help with school costs, the curriculum and school attendance (Bahrain, UK e-government portal, 2016).

Skills recognition (Australia e-government portal, 2016).

Student finance and loans: Including loans, bursaries, grants, student finance and paying back loans, and get answers to the most common questions about student loans and get answers to the most common questions about student loans (UK, USA e-government portal, 2016). Learn about getting help paying for school loans (USA e-government portal, 2016).

VET (Vocational Education and Training) (Australia e-government portal, 2016)

Environment, countryside, Earth, Utilities and Infrastructure (Australia, Bahrain, Estonia, Korea, UK, and USA e-government portal, 2016)

Atlas, Location Based Services and geoexplorer: A positioning service that detects device location & provides location information (Bahrain, Estonia e-government portal, 2016).

Biodiversity, Wildlife and other animals: Protected species, report a sighting and Find out where to get answers to common questions about wildlife and other animals in your community (UK, USA e-government portal, 2016).

Boats and waterways: Boat registration, boat safety and river levels (UK e-government portal, 2016).

Coasts: Coastal erosion, flood defences, bathing water quality (UK e-government portal, 2016).

Countryside: Countryside Code, access to the countryside, landscape (UK e-government portal, 2016).

Electricity, Energy Sources and Energy efficiency: Learn about electricity and energy sources (Australia, USA e-government portal, 2016).

Environmental management and protection (Australia, Korea e-government portal, 2016).

Fishing and hunting: Fishing rod licences, permission and byelaws, lawful hunting (UK e-government portal, 2016).

Fuel and Energy for Homes and Vehicles: Answers to common questions about fuel and energy for transportation and the home (USA e-government portal, 2016).

Going Green: Learn about ways to save the environment and money (USA e-government portal, 2016).

Natural resources (Australia e-government portal, 2016)**.**

Payment of Traffic Contraventions (Bahrain e-government portal, 2016)

Pollution Issues: Learn about the different types of pollution in your community and what you can do about them (USA e-government portal, 2016).

Recycling, waste management and environment impact: Business and commercial waste, environmental permits, report an incident and Includes waste management plans, hazardous waste and preventing pollution (UK e-government portal, 2016).

Request for Electricity and Water Service Disconnection (Bahrain e-government portal, 2016)

Sanitary Connections (Bahrain e-government portal, 2016)

Smart Grid in Energy Sector: Estonian-developed innovation a number of cutting-edge solutions in the energy sector on the top of Smart Grid (Estonia e-government portal, 2016).

Treasure and wrecks: Report wreck material and treasure finds (UK e-government portal, 2016).

Weather monitoring: Find out where to get the latest information you need to protect yourself from dangerous weather (USA e-government portal, 2016).

Government services (Australia, Bahrain, Estonia, Korea, UK and USA e-government portal, 2016)

A–Z of Government Services: Lost superannuation, myGov, visa finder, do not call register, jobsearc

Constitution (Korea e-government portal, 2016).

Daily News (Korea e-government portal, 2016).

Digital Signature: Digital signature enables secure, legally-binding, electronic document signing (Estonia e-government portal, 2016).

E-government services: (Bahrain, Estonia, UK, USA e-government portal, 2016).

Electronic Land Register: A one-of-a-kind information system for storing real estate and land data (Estonia e-government portal, 2016).

E-Cabinet: A powerful tool used by the Estonian government to streamline its decision-making process (Estonia e-government portal, 2016).

E-Law: Allows public access to every piece of draft law that has been submitted since February 2003 (Estonia e-government portal, 2016).

E-Police: Revolutionizes police communication and coordination, maximising effective policing (Estonia e-government portal, 2016).

Electronic ID card: E-ID acts as definitive proof of ID in secure electronic environments (Estonia e-government portal, 2016).

Foreign Affairs (Korea e-government portal, 2016).

I-Voting: I-Voting allows voters to cast their ballots over the internet, from anywhere in the world (Estonia e-government portal, 2016).

Independent Organizations (Korea e-government portal, 2016).

International Relations (Korea e-government portal, 2016).

IT and Communications: Internet, online shopping, postal services, TV and radio (Australia e-government portal, 2016).

Local Governments (Korea e-government portal, 2016).

Mobile-ID: Allows a client to use a mobile phone as a form of secure electronic ID (Estonia e-government portal, 2016).

National Affairs (Korea e-government portal, 2016).

Population Register: The state database for basic information about each person living in Estonia (Estonia e-government portal, 2016).

Presidential Speeches (Korea e-government portal, 2016).

Press Release (Korea e-government portal, 2016).

Publications (Korea e-government portal, 2016).

Social Media (Korea e-government portal, 2016).

State e-Services Portal: A one-stop-shop for the hundreds of e-services offered by government institutions (Estonia e-government portal, 2016).

Summit Diplomacy (Korea e-government portal, 2016).

The Summary (Korea e-government portal, 2016).

Useful Info (Korea e-government portal, 2016).

Villages (Korea e-government portal, 2016).

Website Directory (Korea e-government portal, 2016).

Healthcare (Australia, Bahrain, Estonia, UK and USA e-government portals, 2016)

Children's health (Australia e-government portal, 2016).

Drug and alcohol use (Australia e-government portal, 2016).

Electronic Health Record: Integrates data from healthcare providers into a national record for each patient (Estonia e-government portal, 2016).

Food and Nutrition: Learn about nutrition, help to feed your family, and how to safely prepare food (USA e-government portal, 2016).

Health Insurance: Learn about health insurance, including Medicaid and Medicare (Australia, USA, e-government portal, 2016).

Health Issues: Discover online health resources from the U.S. government (USA e-government portal, 2016)**.**

Health promotion (Australia e-government portal, 2016).

Healthcare (UK e-government portal, 2016).

Information service on general safety and security (Bahrain e-government portal, 2016).

Medications: Get answers to common questions about buying and using medications (USA e-government portal, 2016).

Mental health (Australia e-government portal, 2016).

Public and Private clinic, and medical facilities Find tools to locate doctors, hospitals, care facilities, and other medical facilities (Bahrain, USA e-government portal, 2016).

Social Welfare Medical E-Services: The social welfare benefit system is accessible by a convenient, online (Bahrain, Estonia e-government portal, 2016).

Vaccines and Immunizations: Learn about vaccinations and find help getting them for you and your family (Bahrain, USA e-government portal, 2016).

Housing, property, community welfare and Local services (Australia, Bahrain, Korea, Estonia, UK, and USA e-government portals, 2016)

Affordable Housing: Find help with buying or renting an affordable place to live (USA e-government portal, 2016).

Application for Social and Rehabilitation Assistance (Bahrain e-government portal, 2016).

Being a landlord and renting a property: Includes tenancy agreements, deposit protection scheme and evicting tenants (UK e-government portal, 2016).

Council housing and housing association: Includes Right to buy, shared ownership and getting repairs (UK, USA e-government portal, 2016).

Disabled People Services (Bahrain e-government portal, 2016).

Electronic Land Register: A one-of-a-kind information system for storing real estate and land data (Estonia e-government portal, 2016).

Foreclosure: Learn some of the basics about avoiding and handling foreclosures (USA e-government portal, 2016).

Household energy, electricity and water services: Includes grants, energy saving and renewable energy for your home (Bahrain, UK e-government portal, 2016).

Housing Bank Services (Bahrain e-government portal, 2016).

Housing Help: Find housing resources targeted to certain audience groups (Australia, Korea, USA e-government portal, 2016).

Housing Scams: Beware of these frauds and scams when buying or foreclosing on a home (USA e-government portal, 2016).

Housing Services Eligibility Criteria (Bahrain, Korea e-government portal, 2016).

Housing-Related Complaints: Find out what to do if you have one of these complaints when buying or renting a home (USA e-government portal, 2016).

Land Classifications and Requirements System (Bahrain e-government portal, 2016)

Land Survey Services (Bahrain e-government portal, 2016)

Local councils and services: Find and access local services (UK e-government portal, 2016).

Mortgages: Learn some of the basics about mortgages (USA e-government portal, 2016).

Moving: Find resources to help you when you're moving (USA e-government portal, 2016).

Noise, neighbours, pets and pests: Includes neighbour disputes, reporting noise nuisance, pest control and looking after pets (UK e-government portal, 2016).

Owning a property: Includes buying and selling your home, compensation, mortgages and property boundaries (UK e-government portal, 2016).

Planning permission and building regulations: Includes building regulation approvals, planning decisions and party walls (Bahrain, UK e-government portal, 2016).

Postal Service Issues: Find answers to the most popular Post Office questions (Bahrain, USA e-government portal, 2016).

Recycling, rubbish, streets and roads: Includes collecting large waste items, garden waste and reporting problems (UK e-government portal, 2016).

Repairing and Improving a Home: Look for help with repairing or making improvements to your home (Bahrain, USA e-government portal, 2016).

Repossessions, emergency housing and evictions: Includes eviction from private, council and housing association properties, and squatting (UK e-government portal, 2016).

Safety and the environment in your community: Includes smoke control areas, road safety and crime prevention and find most frequently requested information about safety in home (UK, USA e-government portal, 2016).

Social welfare e-services (Estonia e-government portal, 2016).

Military, Veterans, security and defence (Australia, Korea, UK and USA e-government portal, 2016)

- **Join the Military:** Learn how you can enter the military services as an officer or enlisted member (USA e-government portal, 2016).
- **Locate Military Members, Units, and Facilities:** Find a member of the military or a military unit or facility (USA e-government portal, 2016).
- **Military Colleges and Academies:** Learn about military schools and service academies, which train future officers, doctors, engineers and other military professionals (USA e-government portal, 2016).
- **Military Members and Families:** Find answers for many common questions for military personnel and their families (USA e-government portal, 2016).

Military recruitment, training and operation (Korea, UK e-government portal, 2016).

- **Veterans:** Find information for military veterans and their families (Australia, USA e-government portal, 2016).

Armed forces: Includes reserve forces and armed forces pensions, benefits and financial assistance (UK e-government portal, 2016).

Commemoration (Australia e-government portal, 2016).

Cyber security (Australia e-government portal, 2016).

DF (Defence Force) (Australia e-government portal, 2016).

National security (Australia e-government portal, 2016).

Money, Tax, Shopping and Financial services (Australia, Bahrain, Estonia, Korea, UK, and USA e-government portals, 2016)

BN (Business Number) is a unique digit number that identifies your business to the government and community. (Australia e-government portal, 2016).

Buying from the Government: Find out about surplus sales, collectibles, and other items available through purchase or auction (USA e-government portal, 2016).

Capital Gains Tax: Tax when you sell property, shares, personal possessions and business assets (UK e-government portal, 2016).

Clothing and Fashion (Korea e-government portal, 2016).

Court claims, debt and bankruptcy: Includes recovering debts, registering for bankruptcy and as a creditor (UK e-government portal, 2016).

Currency: Learn about American money (USA e-government portal, 2016).

E-Tax: E-Tax has drastically reduced the time spent by individuals and entrepreneurs on filing taxes (Estonia e-government portal, 2016).

Financial regulation and Support (Australia, Bahrain e-government portal, 2016).

Income Tax: Includes rates and allowances, tax codes and refunds (UK e-government portal, 2016).

Inheritance Tax: Includes valuing an estate, trusts and taxes (UK e-government portal, 2016).

Mobile Payment: Enables payment for goods and services using mobile phones (Estonia e-government portal, 2016).

Money (Bahrain, Korea e-government portal, 2016).

Municipal Tax: Includes council tax appeals, bands, discounts and reductions (Bahrain, UK e-government portal, 2016).

National Insurance: Voluntary contributions and credits, numbers, rates and classes (UK e-government portal, 2016).

Personal finance (Australia e-government portal, 2016).

Request for Release of Minor Funds (Bahrain e-government portal, 2016).

Self-Assessment: Includes filing, deadlines, pay and tax records (UK e-government portal, 2016).

Shopping and Consumer Issues: Learn how to be a safe consumer, what to do when a purchase or service goes wrong, and more (Korea, USA e-government portal, 2016).

State Budget (Bahrain e-government portal, 2016).

Tax credits: Includes Working Tax Credit, Child Tax Credit and when tax credits stop and to find answers to top questions about filing federal income tax, paying, getting refunds, and more (Korea, UK, USA e-government portal, 2016).

Tax returns (Australia e-government portal, 2016).

Unclaimed Money from the Government: Find unclaimed funds held by the government that might be owed to you (USA e-government portal, 2016).

VAT (Value Added Tax): Includes online returns, rates, charging and record keeping (UK e-government portal, 2016).

Visas, Immigration, Passport, Travel, Tourism, personal documents and living abroad (Australia, Bahrain, Estonia, Korea, UK, and USA e-government portal, 2016)

Asylum: Claiming asylum as a refugee, the asylum process and support (UK e-government portal, 2016).

Citizens Traveling Abroad (e-register): Explore some of the top issues for Citizens when traveling outside of the country (Australia, Bahrain, Korea, USA e-government portal, 2016.

Embassies Abroad (Bahrain e-government portal, 2016).

Embassies and consulates (Australia e-government portal, 2016).

Family visas: Visiting the UK for 6 months or more, including visas for partners (eg spouse) and family members (UK e-government portal, 2016).

Flight Information (Bahrain e-government portal, 2016).

Honours and awards (Australia e-government portal, 2016).

Hotel Directory (Bahrain e-government portal, 2016).

Immigration and Citizenship: Learn about U.S. residency and citizenship requirements and issues (USA e-government portal, 2016).

Immigration appeals and legal advice: Appeal against a visa, settlement or asylum decision, legal advice (UK e-government portal, 2016).

Living abroad: Includes tax, State Pension, benefits and government services abroad (USA e-government portal, 2016.

Manage your visa application: Visa processing times, biometric information, premium services, report a change (UK e-government portal, 2016).

Migration and tourism (Australia e-government portal, 2016).

Passports and Passport Renewal: Eligibility, fees, applying, renewing and updating (Estonia, USA e-government portal, 2016).

Recreation and Travel within the Country: Find frequently requested government information on recreation activities and traveling in the country (USA e-government portal, 2016.

Settle in the country: Get indefinite leave to remain (ILR) (UK e-government portal, 2016).

Smart Card Appointment (USA e-government portal, 2016).

Sponsor workers or students: Licences and certificates of sponsorship for employers and universities and colleges (UK e-government portal, 2016).

Student visas: Short-term study visas for students (Australia, Bahrain, UK e-government portal, 2016).

Tourist and short stay visas: Visiting the country for up to 6 months and find the answers to common questions about visiting the United States (Australia, Bahrain, UK, USA e-government portal, 2016).

Tourist Attractions and Shopping Centres (Korea e-government portal, 2016).

Transit visas: In transit through the UK: airside, landside or the common travel area (UK e-government portal, 2016).

Visa Services (Bahrain e-government portal, 2016).

Work visas: Paid and voluntary work visas (Australia, Bahrain, UK e-government portal, 2016).

Working, Jobs, workplace, unemployment and pensions (Australia, Bahrain, Korea, UK, and USA e-government portals, 2016)

Careers and disability careers: Includes recruitment and disabled people, reasonable adjustments at work and Access to Work. (Australia, UK e-government portal, 2016).

Customer Care Services (Bahrain e-government portal, 2016)**.**

Finding a job: Job search, Jobseeker's Allowance (JSA), volunteering, apprenticeships and job offers (Korea, UK e-government portal, 2016).

Government jobs and employment services: Learn where to get the answers to some of the questions asked most often by federal workers (Australia, Korea, USA e-government portal, 2016).

Holidays, time off, sick leave, maternity and paternity leave: Includes career breaks and the holiday entitlement calculator (UK e-government portal, 2016).

Labour and Social Welfare System (Korea e-government portal, 2016).

Labour Laws and Issues: Learn about the employment laws and issues that people ask government (Bahrain, USA e-government portal, 2016).

Looking for a New Job and people: Find out how to look for work in the private sector and federal government (Korea, USA e-government portal, 2016).

Pre-employment health check-up appointment (Bahrain e-government portal, 2016).

Public Service and Volunteer Opportunities: Find volunteer opportunities from federal organisations in your community (USA e-government portal, 2016)**.**

Redundancies, dismissals and disciplinary: Includes solving a workplace dispute, calculating redundancy pay and dismissal (UK e-government portal, 2016).

Retirement: Learn some of the basics about retirement and pension benefits (Australia, USA e-government portal, 2016).

State Pension: Calculating State Pension, Pension Credit, eligibility, claiming and deferring (UK e-government portal, 2016).

Unemployment Benefits and Other Help for the Unemployed: Discover some of the programs and resources that can help if you lose your job (USA e-government portal, 2016).

Working conditions (Australia e-government portal, 2016).

Workplace and personal pensions: Includes automatic enrolment, lost pensions and planning for retirement (UK e-government portal, 2016).

Workplace health and safety (Australia, Bahrain e-government portal, 2016).

Your contract and working hours: Includes employment status, workers' rights and changes to contracts (UK e-government portal, 2016).

Your pay, tax and the National Minimum Wage: Includes National Minimum Wage rates, keeping pay records and pay rights (UK e-government portal, 2016).

Your rights at work and trade unions: Includes health and safety, accidents at work and joining a trade union (UK e-government portal, 2016).

Religion, Culture, History and Social affairs (Australia and Korea e-government portal, 2016)

Culture and Cultural institutions (Korea, Australia e-government portal, 2016)

Family history (Australia e-government portal, 2016).

Historical Background (Australia, Korea e-government portal, 2016).

Historical Heritage (Australia, Korea e-government portal, 2016).

Indigenous heritage and history (Australia e-government portal, 2016).

Military history (Australia e-government portal, 2016).

Religion (Korea e-government portal, 2016).

The Beginnings of the Country History (Korea e-government portal, 2016).

Traditional Arts (Korea e-government portal, 2016).

Transformation into a Multicultural Society (Korea e-government portal, 2016)**.**

UNESCO (The United Nations Educational, Scientific and Cultural Organisation) Heritage (Korea e-government portal, 2016)**.**

Limited Life Services and emergencies

Disasters and Emergencies

After a Disaster: Get answers to common questions after a disaster has occurred (USA e-government portal, 2016).

Clean Up After a Disaster: Learn the safest way to clean up after a disaster affects your community (USA e-government portal, 2016).

Crisis (Australia e-government portal, 2016)**.**

Financial Assistance after a Disaster: Find out how to get financial assistance from the government if you've been the victim of a disaster (USA e-government portal, 2016).

Natural disasters (Korea e-government portal, 2016).

Prepare for Disasters and Emergencies: Find information you need to be ready to handle a disaster or emergency (USA e-government portal, 2016).

Flooding and extreme weather: Flood warnings and getting help (UK e-government portal, 2016).

Exhibitions (Korea e-government portal, 2016).

Religious Festival, Celebrations and Holiday

Hajj and Umrah Services.

New Year Celebration.

Major Local Festivals (Korea e-government portal, 2016).

National holidays (Korea e-government portal, 2016).

Parliamentary elections (Korea e-government portal, 2016).

Seminars and conferences (Korea e-government portal, 2016).

Sports and cultural events

National and world cup (Australia, Bahrain, Estonia, Korea, UK and USA e-government portal, 2016)

Appendix D: SPSS Frequency Reports

Case Processing Summary

		N	%
Cases	Valid	432	98.2
	Excluded[a]	8	1.8
	Total	440	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.829	77

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q2.	153.52	259.044	.018	.829
Q3.	152.22	260.222	-.051	.832
Q4.	153.65	260.321	-.059	.831
Q6.1	152.96	258.954	.061	.829
Q6.2	153.46	259.302	.000	.830
Q6.3	153.23	260.750	-.093	.831
Q6.4	152.95	258.443	.125	.828

Q6.5	153.04	258.843	.048	.829
Q6.6	153.20	258.035	.087	.829
Q6.7	153.32	259.490	-.012	.830
Q6.8	153.11	258.179	.089	.829
Q6.9	152.92	259.230	.046	.829
Q6.10	152.91	259.305	.043	.829
Q6.11	153.08	259.247	.011	.829
Q6.12	152.93	259.116	.054	.829
Q6.13	153.62	259.559	-.015	.830
Q6.14	152.91	258.906	.122	.829
Q6.15	153.02	259.079	.032	.829
Q6.16	152.93	259.348	.021	.829
Q6.17	153.06	259.076	.027	.829
Q6.19	151.10	254.358	-.024	.854
Q7.	153.37	256.578	.170	.828
Q8.1	153.72	260.909	-.125	.830
Q8.2	152.90	259.273	.059	.829
Q8.3	152.89	259.630	-.033	.829
Q8.4	152.98	260.352	-.092	.830
Q8.5	153.37	258.430	.054	.829
Q8.6	152.95	260.035	-.067	.830
Q9.	153.11	255.308	.084	.831

Q10.1	153.69	258.967	.033	.829
Q10.2	153.47	260.139	-.052	.830
Q10.3	152.98	258.939	.053	.829
Q10.4	153.63	260.081	-.051	.830
Q10.5	152.88	259.548	.000	.829
Q11.	152.28	259.696	-.027	.831
Q12	153.65	255.694	.210	.827
Q13	153.77	257.568	.157	.828
Q14	153.75	257.390	.173	.828
Q15	152.81	248.853	.426	.823
Q16	152.65	244.726	.543	.821
Q17	152.39	243.181	.545	.820
Q18	152.61	243.685	.543	.820
Q19	153.11	245.884	.461	.822
Q20	152.21	239.816	.537	.819
Q21	152.90	248.753	.248	.827
Q22	152.75	244.543	.544	.821
Q23	152.79	244.517	.474	.821
Q24	152.72	245.400	.481	.822
Q25	152.89	244.607	.562	.820
Q26	152.68	245.046	.436	.822
Q27	152.66	243.020	.536	.820

Q28	152.41	242.498	.519	.820
Q29	152.52	244.055	.535	.820
Q30	152.73	248.060	.423	.823
Q31	152.89	249.733	.353	.824
Q32	152.86	248.202	.352	.824
Q33	153.07	256.787	.061	.831
Q34	152.87	251.101	.293	.826
Q35	152.44	244.865	.469	.822
Q36	152.11	243.112	.385	.823
Q37	152.48	246.064	.327	.825
Q38	153.15	251.288	.330	.825
Q39	152.66	250.830	.260	.826
Q40	153.27	252.206	.314	.825
Q41	152.89	247.622	.400	.823
Q42.1	153.21	250.812	.402	.824
Q42.2	153.06	248.892	.410	.823
Q42.3	151.39	255.849	.069	.831
Q42.4	150.91	255.690	.101	.830
Q42.5	151.65	257.732	.011	.833
Q42.6	151.38	257.541	.031	.831
Q42.7	152.79	247.237	.445	.823
Q42.8	152.84	250.264	.299	.825

Q42.9	153.14	251.542	.308	.825
Q43	153.01	247.622	.502	.822
Q44	153.01	248.448	.455	.823
Q45	152.58	245.872	.424	.822

Frequency Table

Q2.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	276	62.7	63.9	63.9
	Female	156	35.5	36.1	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q3.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19-24	21	4.8	4.9	4.9
	25-34	165	37.5	38.2	43.1
	35-44	188	42.7	43.5	86.6
	45-55	54	12.3	12.5	99.1
	>55	4	.9	.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q4.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	367	83.4	85.0	85.0
	Usually	30	6.8	6.9	91.9
	Sometime	35	8.0	8.1	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	33	7.5	7.6	7.6
	2	399	90.7	92.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	250	56.8	57.9	57.9
	2	182	41.4	42.1	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		

Total		440	100.0		

Q6.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	152	34.5	35.2	35.2
	2	280	63.6	64.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	7.0	7.2	7.2
	2	401	91.1	92.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	69	15.7	16.0	16.0
	2	363	82.5	84.0	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	137	31.1	31.7	31.7
	2	295	67.0	68.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	190	43.2	44.0	44.0
	2	242	55.0	56.0	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	97	22.0	22.5	22.5
	2	335	76.1	77.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	3.6	3.7	3.7
	2	416	94.5	96.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	2.5	2.5	2.5
	2	421	95.7	97.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	85	19.3	19.7	19.7
	2	347	78.9	80.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.12

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	1	22	5.0	5.1	5.1
	2	410	93.2	94.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	318	72.3	73.6	73.6
	2	114	25.9	26.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	2.5	2.5	2.5
	2	421	95.7	97.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.15

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	58	13.2	13.4	13.4

	2	374	85.0	86.6	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.16

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	22	5.0	5.1	5.1
	2	410	93.2	94.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q6.17

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	76	17.3	17.6	17.6
	2	356	80.9	82.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q7.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	212	48.2	49.1	49.1
	Unemployed	220	50.0	50.9	100.0

	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q8.1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Citizen	360	81.8	83.3	83.3
	Non Citizen	72	16.4	16.7	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q8.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Resident	8	1.8	1.9	1.9
	Non Resident	424	96.4	98.1	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q8.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Visitor	3	.7	.7	.7
	Non Visitor	429	97.5	99.3	100.0
	Total	432	98.2	100.0	

Missing	System	8	1.8		
Total		440	100.0		

Q8.4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business	43	9.8	10.0	10.0
	Non Business	389	88.4	90.0	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q8.5

		Frequency	Percent	Valid Percent	Cumula
Valid	Government Employee	213	48.4	49.3	
	Non Government Employee	219	49.8	50.7	
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q8.6

		Frequency	Percent	Valid Percent	Cumulative
Valid	Private Employee	31	7.0	7.2	
	Non Private Employee	401	91.1	92.8	
	Total	432	98.2	100.0	
Missing	System	8	1.8		

Total		440	100.0		

Distance to eService

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25	239	54.3	55.3	55.3
	26	115	26.1	26.6	81.9
	51	40	9.1	9.3	91.2
	76	13	3.0	3.0	94.2
	101	25	5.7	5.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q10.1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at home	84	19.1	19.4	19.4
	Home	348	79.1	80.6	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q10.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at work	176	40.0	40.7	40.7
	Work	256	58.2	59.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q10.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at Internet Cafe	388	88.2	89.8	89.8
	Internet Cafe	44	10.0	10.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q10.4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not through mobile	109	24.8	25.2	25.2
	Mobile	323	73.4	74.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q10.5

		Frequency	Percent	Valid Percent	Cumulative Per
Valid	Have Access	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

No. Internetways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	145	33.0	33.6	33.6
	2	75	17.0	17.4	50.9
	3	172	39.1	39.8	90.7
	4	40	9.1	9.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q11.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Server	39	8.9	9.0	9.0
	Cloud	94	21.4	21.8	30.8
	Both	299	68.0	69.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

No.UsageEgov

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	133	30.2	30.8	30.8
	2	299	68.0	69.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	351	79.8	81.3	81.3
	Agree	67	15.2	15.5	96.8
	Neutral	11	2.5	2.5	99.3
	Disagree	2	.5	.5	99.8
	Strongly Disagree	1	.2	.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	391	88.9	90.5	90.5
	Agree	37	8.4	8.6	99.1

	Neutral	2	.5	.5	99.5
	Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	379	86.1	87.7	87.7
	Agree	49	11.1	11.3	99.1
	Neutral	4	.9	.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q15

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	85	19.3	19.7	19.7
	Agree	250	56.8	57.9	77.5
	Neutral	77	17.5	17.8	95.4
	Disagree	19	4.3	4.4	99.8
	Strongly Disagree	1	.2	.2	100.0
	Total	432	98.2	100.0	

Missing	System	8	1.8		
Total		440	100.0		

Q16

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	72	16.4	16.7	16.7
	Agree	222	50.5	51.4	68.1
	Neutral	104	23.6	24.1	92.1
	Disagree	32	7.3	7.4	99.5
	Strongly Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q17

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	51	11.6	11.8	11.8
	Agree	186	42.3	43.1	54.9
	Neutral	134	30.5	31.0	85.9
	Disagree	54	12.3	12.5	98.4
	Strongly Disagree	7	1.6	1.6	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		

Total		440	100.0		

Q18

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	76	17.3	17.6	17.6
	Agree	211	48.0	48.8	66.4
	Neutral	103	23.4	23.8	90.3
	Disagree	37	8.4	8.6	98.8
	Strongly Disagree	5	1.1	1.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q19

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	191	43.4	44.2	44.2
	Agree	180	40.9	41.7	85.9
	Neutral	37	8.4	8.6	94.4
	Disagree	16	3.6	3.7	98.1
	Strongly Disagree	8	1.8	1.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q20

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	70	15.9	16.2	16.2
	Agree	123	28.0	28.5	44.7
	Neutral	142	32.3	32.9	77.5
	Disagree	71	16.1	16.4	94.0
	Strongly Disagree	26	5.9	6.0	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q21

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5min-15min	196	44.5	45.4	45.4
	16min-30min	132	30.0	30.6	75.9
	31min-45min	52	11.8	12.0	88.0
	46min-60min	20	4.5	4.6	92.6
	>60min	32	7.3	7.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q21.1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	200	45.5	45.5	45.5
	16	133	30.2	30.2	75.7
	31	54	12.3	12.3	88.0
	46	20	4.5	4.5	92.5
	61	33	7.5	7.5	100.0
	Total	440	100.0	100.0	

Q21.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	200	45.5	45.5	45.5
	30	133	30.2	30.2	75.7
	45	54	12.3	12.3	88.0
	60	20	4.5	4.5	92.5
	70	33	7.5	7.5	100.0
	Total	440	100.0	100.0	

Q22

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	90	20.5	20.8	20.8
	Agree	231	52.5	53.5	74.3
	Neutral	81	18.4	18.8	93.1
	Disagree	26	5.9	6.0	99.1
	Strongly Disagree	4	.9	.9	100.0

	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q23

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	113	25.7	26.2	26.2
	Agree	222	50.5	51.4	77.5
	Neutral	54	12.3	12.5	90.0
	Disagree	32	7.3	7.4	97.5
	Strongly Disagree	11	2.5	2.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q24

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	97	22.0	22.5	22.5
	Agree	205	46.6	47.5	69.9
	Neutral	97	22.0	22.5	92.4
	Disagree	28	6.4	6.5	98.8
	Strongly Disagree	5	1.1	1.2	100.0
	Total	432	98.2	100.0	

Missing	System	8	1.8		
Total		440	100.0		

Q25

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	121	27.5	28.0	28.0
	Agree	211	48.0	48.8	76.9
	Neutral	84	19.1	19.4	96.3
	Disagree	13	3.0	3.0	99.3
	Strongly Disagree	3	.7	.7	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q26

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	118	26.8	27.3	27.3
	Agree	159	36.1	36.8	64.1
	Neutral	109	24.8	25.2	89.4
	Disagree	40	9.1	9.3	98.6
	Strongly Disagree	6	1.4	1.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		

Total		440	100.0		

Q27

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	90	20.5	20.8	20.8
	Agree	208	47.3	48.1	69.0
	Neutral	87	19.8	20.1	89.1
	Disagree	40	9.1	9.3	98.4
	Strongly Disagree	7	1.6	1.6	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q28

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	67	15.2	15.5	15.5
	Agree	175	39.8	40.5	56.0
	Neutral	124	28.2	28.7	84.7
	Disagree	53	12.0	12.3	97.0
	Strongly Disagree	13	3.0	3.0	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q29

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	62	14.1	14.4	14.4
	Agree	203	46.1	47.0	61.3
	Neutral	120	27.3	27.8	89.1
	Disagree	43	9.8	10.0	99.1
	Strongly Disagree	4	.9	.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q30

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	89	20.2	20.6	20.6
	Agree	209	47.5	48.4	69.0
	Neutral	115	26.1	26.6	95.6
	Disagree	16	3.6	3.7	99.3
	Strongly Disagree	3	.7	.7	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q31

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	118	26.8	27.3	27.3
	Agree	228	51.8	52.8	80.1
	Neutral	61	13.9	14.1	94.2
	Disagree	23	5.2	5.3	99.5
	Strongly Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q32

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	136	30.9	31.5	31.5
	Agree	193	43.9	44.7	76.2
	Neutral	65	14.8	15.0	91.2
	Disagree	32	7.3	7.4	98.6
	Strongly Disagree	6	1.4	1.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q33

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Agree	201	45.7	46.5	46.5
	Agree	146	33.2	33.8	80.3
	Neutral	54	12.3	12.5	92.8
	Disagree	26	5.9	6.0	98.8
	Strongly Disagree	5	1.1	1.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q34

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	117	26.6	27.1	27.1
	Agree	219	49.8	50.7	77.8
	Neutral	75	17.0	17.4	95.1
	Disagree	16	3.6	3.7	98.8
	Strongly Disagree	5	1.1	1.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q35

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	60	13.6	13.9	13.9

	Agree	190	43.2	44.0	57.9
	Neutral	125	28.4	28.9	86.8
	Disagree	47	10.7	10.9	97.7
	Strongly Disagree	10	2.3	2.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q36

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	68	15.5	15.7	15.7
	Agree	147	33.4	34.0	49.8
	Neutral	76	17.3	17.6	67.4
	Disagree	99	22.5	22.9	90.3
	Strongly Disagree	42	9.5	9.7	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q37

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	108	24.5	25.0	25.0
	Agree	156	35.5	36.1	61.1

	Neutral	78	17.7	18.1	79.2
	Disagree	65	14.8	15.0	94.2
	Strongly Disagree	25	5.7	5.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q38

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	180	40.9	41.7	41.7
	Agree	197	44.8	45.6	87.3
	Neutral	48	10.9	11.1	98.4
	Disagree	5	1.1	1.2	99.5
	Strongly Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q39

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	95	21.6	22.0	22.0
	Agree	200	45.5	46.3	68.3
	Neutral	86	19.5	19.9	88.2

	Disagree	46	10.5	10.6	98.8
	Strongly Disagree	5	1.1	1.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q40

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	212	48.2	49.1	49.1
	Agree	180	40.9	41.7	90.7
	Neutral	36	8.2	8.3	99.1
	Disagree	3	.7	.7	99.8
	Strongly Disagree	1	.2	.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q41

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	136	30.9	31.5	31.5
	Agree	194	44.1	44.9	76.4
	Neutral	79	18.0	18.3	94.7
	Disagree	17	3.9	3.9	98.6

	Strongly Disagree	6	1.4	1.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	182	41.4	42.1	42.1
	Agree	213	48.4	49.3	91.4
	Neutral	35	8.0	8.1	99.5
	Disagree	1	.2	.2	99.8
	Strongly Disagree	1	.2	.2	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	160	36.4	37.0	37.0
	Agree	200	45.5	46.3	83.3
	Neutral	60	13.6	13.9	97.2
	Disagree	11	2.5	2.5	99.8
	Strongly Disagree	1	.2	.2	100.0

	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	24	5.5	5.6	5.6
	Agree	60	13.6	13.9	19.4
	Neutral	110	25.0	25.5	44.9
	Disagree	157	35.7	36.3	81.3
	Strongly Disagree	81	18.4	18.8	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	13	3.0	3.0	3.0
	Agree	17	3.9	3.9	6.9
	Neutral	61	13.9	14.1	21.1
	Disagree	218	49.5	50.5	71.5
	Strongly Disagree	123	28.0	28.5	100.0
	Total	432	98.2	100.0	

Missing	System	8	1.8		
Total		440	100.0		

Q42.5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	47	10.7	10.9	10.9
	Agree	73	16.6	16.9	27.8
	Neutral	94	21.4	21.8	49.5
	Disagree	168	38.2	38.9	88.4
	Strongly Disagree	50	11.4	11.6	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	20	4.5	4.6	4.6
	Agree	43	9.8	10.0	14.6
	Neutral	128	29.1	29.6	44.2
	Disagree	183	41.6	42.4	86.6
	Strongly Disagree	58	13.2	13.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		

Total		440	100.0		

Q42.7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	102	23.2	23.6	23.6
	Agree	214	48.6	49.5	73.1
	Neutral	95	21.6	22.0	95.1
	Disagree	17	3.9	3.9	99.1
	Strongly Disagree	4	.9	.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	126	28.6	29.2	29.2
	Agree	195	44.3	45.1	74.3
	Neutral	84	19.1	19.4	93.8
	Disagree	21	4.8	4.9	98.6
	Strongly Disagree	6	1.4	1.4	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q42.9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	181	41.1	41.9	41.9
	Agree	194	44.1	44.9	86.8
	Neutral	47	10.7	10.9	97.7
	Disagree	8	1.8	1.9	99.5
	Strongly Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q43

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	136	30.9	31.5	31.5
	Agree	224	50.9	51.9	83.3
	Neutral	64	14.5	14.8	98.1
	Disagree	8	1.8	1.9	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

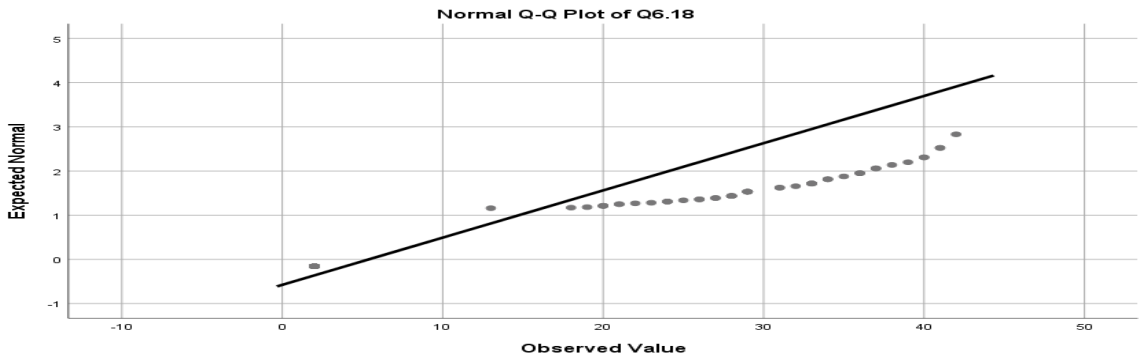
Q44

	Frequency	Percent	Valid Percent	Cumulative Percent

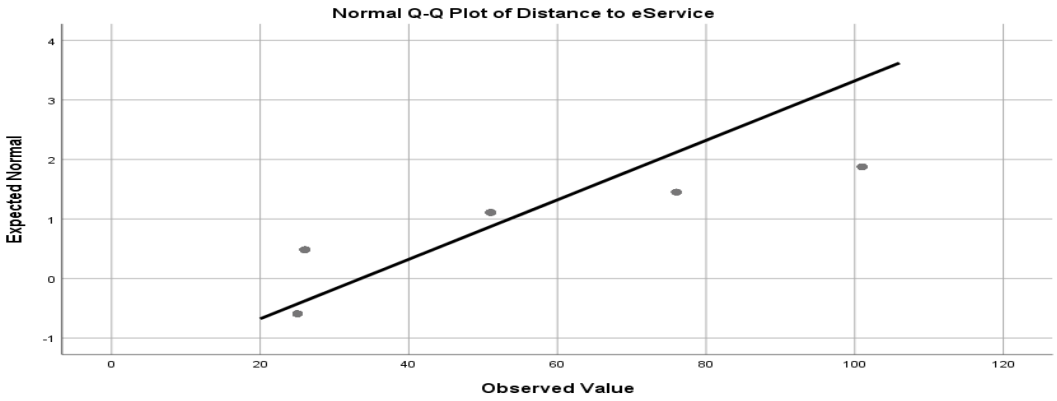
Valid	Strongly Agree	136	30.9	31.5	31.5
	Agree	223	50.7	51.6	83.1
	Neutral	66	15.0	15.3	98.4
	Disagree	5	1.1	1.2	99.5
	Strongly Disagree	2	.5	.5	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		

Q45

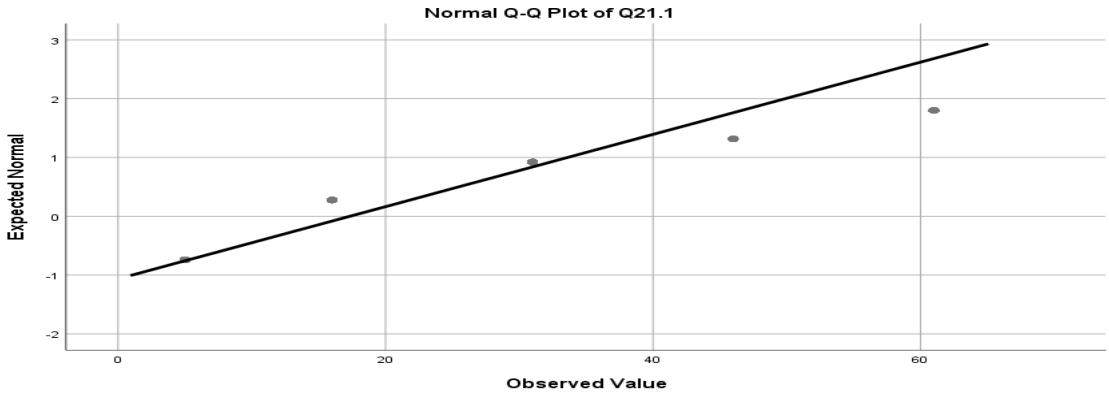
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	82	18.6	19.0	19.0
	Agree	200	45.5	46.3	65.3
	Neutral	99	22.5	22.9	88.2
	Disagree	41	9.3	9.5	97.7
	Strongly Disagree	10	2.3	2.3	100.0
	Total	432	98.2	100.0	
Missing	System	8	1.8		
Total		440	100.0		



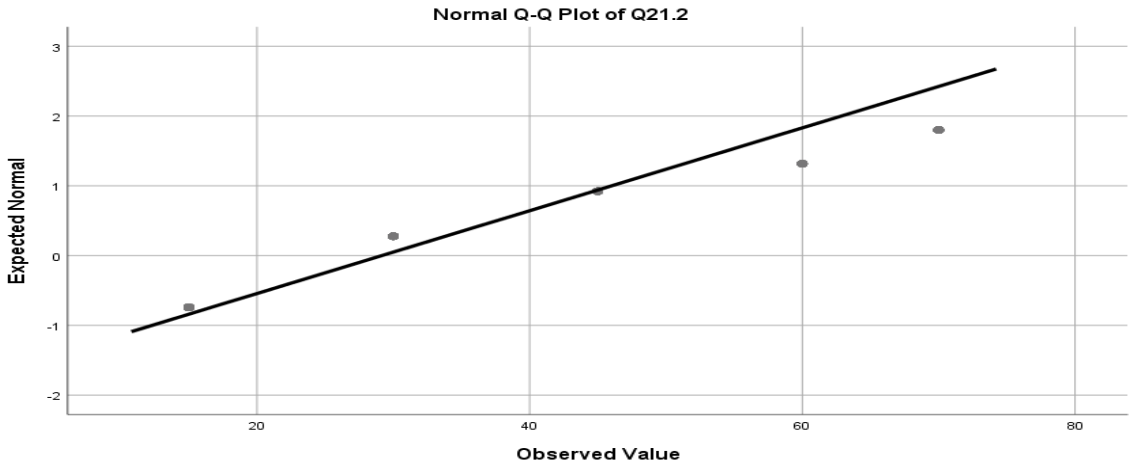
Testing Normality of Ministry bodies



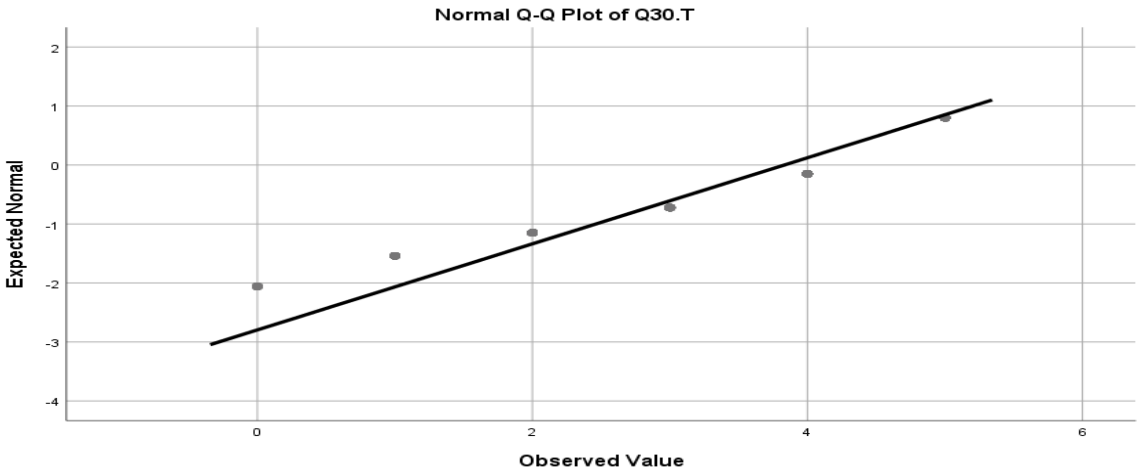
Testing Normality distance to e-services



Testing Normality for minimum distance accepted by responders to access Internet



Testing Normality for maximum distance acceptable by responders to access internet



Testing Normality for total challenges facing e-government services

Normality test for Males and age group 19-24

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.505	8	.000	.433	8	.000
Minimum distance accepted by responders to access Internet	.236	8	.200*	.825	8	.053
Maximum distance accepted by responders to access Internet	.228	8	.200*	.835	8	.067
Total challenges facing e-government services	.250	8	.150	.860	8	.120

*. This is a lower bound of the true significance.

a. Q2. = Male, Q3. = 19-24

b. Lilliefors Significance Correction

Normality test for Males and age group 25-34

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.454	91	.000	.494	91	.000
Minimum distance accepted by responders to access Internet	.291	91	.000	.756	91	.000
Maximum distance accepted by responders to access Internet	.246	91	.000	.793	91	.000
Total challenges facing e-government services	.253	91	.000	.816	91	.000

a. Q2. = Male, Q3. = 25-34

b. Lilliefors Significance Correction

Normality test for Males and age group 35-44

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.491	126	.000	.388	126	.000
Minimum distance accepted by responders to access Internet	.283	126	.000	.699	126	.000
Maximum distance accepted by responders to access Internet	.289	126	.000	.750	126	.000
Total challenges facing e-government services	.241	126	.000	.816	126	.000
a. Q2. = Male, Q3. = 35-44						
b. Lilliefors Significance Correction						

Normality test for Males and age group 44-55

Tests of Normality						
	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.498	47	.000	.395	47	.000
Minimum distance accepted by responders to access Internet	.327	47	.000	.739	47	.000

Maximum distance accepted by responders to access Internet	.280	47	.000	.787	47	.000
Total challenges facing e-government services	.317	47	.000	.686	47	.000
a. Q2. = Male, Q3. = 45-55						
b. Lilliefors Significance Correction						

Normality test for Males and age group > 55

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.	4	.	.	4	.
Minimum distance accepted by responders to access Internet	.441	4	.	.630	4	.001
Maximum distance accepted by responders to access Internet	.441	4	.	.630	4	.001
Total challenges facing e-government services	.250	4	.	.945	4	.683
a. Q2. = Male, Q3. = >55						
b. Lilliefors Significance Correction						

Normality test for Females and age group 19-24

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.459	13	.000	.569	13	.000
Minimum distance accepted by responders to access Internet	.328	13	.000	.703	13	.001
Maximum distance accepted by responders to access Internet	.277	13	.007	.755	13	.002
Total challenges facing e-government services	.312	13	.001	.786	13	.005

a. Q2. = Female, Q3. = 19-24

b. Lilliefors Significance Correction

Normality test for Females and age group 25-34

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.421	74	.000	.585	74	.000

Minimum distance accepted by responders to access Internet	.301	74	.000	.697	74	.000
Maximum distance accepted by responders to access Internet	.288	74	.000	.742	74	.000
Total challenges facing e-government services	.251	74	.000	.787	74	.000
a. Q2. = Female, Q3. = 25-34						
b. Lilliefors Significance Correction						

Normality test for Females and age group 35-44

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.435	62	.000	.568	62	.000
Minimum distance accepted by responders to access Internet	.269	62	.000	.825	62	.000
Maximum distance accepted by responders to access Internet	.229	62	.000	.856	62	.000
Total challenges facing e-government services	.246	62	.000	.793	62	.000

a. Q2. = Female, Q3. = 35-44

b. Lilliefors Significance Correction

Normality test for Females and age group 45-55

Tests of Normality

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Distance to eService	.504	7	.000	.453	7	.000
Minimum distance accepted by responders to access Internet	.391	7	.002	.559	7	.000
Maximum distance accepted by responders to access Internet	.400	7	.001	.591	7	.000
Total challenges facing e-government services	.240	7	.200*	.864	7	.163

*. This is a lower bound of the true significance.

a. Q2. = Female, Q3. = 45-55

b. Lilliefors Significance Correction

Appendix E: The List of Public Sector Institutions in Oman.

No.	Institution Name	Website
1	Ministry of Agriculture and Fisheries	www.maf.gov.om
2	Ministry of Awqaf (Endowments) and Religious Affairs	www.mara.gov.om
3	Ministry of Civil Service	www.omanmocs.com
4	Ministry of Commerce and Industry	www.mocioman.gov.om
5	Ministry of Defence	www.mod.gov.om
6	Ministry of Environment and Climate Affairs	https://meca.gov.om
7	Ministry of Finance	www.mof.gov.om
8	Ministry of Foreign Affairs	https://www.mofa.gov
9	Ministry of Health	http://www.moh.gov.om/
10	Ministry of Heritage and Culture	www.mnhc.gov.om
11	Ministry of Education	www.moe.gov.om
12	Ministry of Higher Education -	www.mohe.gov.om
13	Ministry of Housing	Housing.gov.om
14	Ministry of Information	www.omanet.com
15	Ministry of Interior	https://www.moi.gov.om
16	Ministry of Justice	www.moj.gov.om
17	Ministry of Legal Affairs	www.mola.gov.om
18	Ministry of Manpower	https://www.manpower.gov.om
19	Ministry of Oil and Gas	www.mog.gov.om
20	Ministry of Regional Municipalities, Environ and Water Resources	https://www.mrmwr.gov.om

21	Ministry of Social Development	https://www.mosd.gov.om
22	Ministry of Sports Affairs	https://www.mosa.gov.om
23	Ministry of Tourism	www.omantourism.gov.om
24	Ministry of Transport & Communication	https://www.motc.gov.om
25	General Authority for Civil Aviation	https://www.paca.gov.om
26	The National Records and Achieves Authority	www.nraa.gov.om
27	The Public Authority for Manpower Register	https://pamr.gov.om
28	The Public Authority for Craft Industries	https://www.paci.gov.om
29	The Public Authority for Consumer Protection	pacp.gov.om
30	The Public Authority for Radio and TV	part.gov.om/part/
31	The Public Authority for Social Insurance	https://www.pasi.gov.om
32	The Public Authority for Stores and Food Reserve	https://www.pasfr.gov.om
33	The Public Authority for Electricity and Water	https://www.paew.gov.om
34	The Special Economic Zone Authority at Duqm	www.duqm.gov.om/
35	The Public Authority for Civil Defence and Ambulance	pacdaoman.gov.om
36	The Telecommunication Regulatory Authority	https://www.tra.gov.om
37	The Information Technology Authority	https://www.ita.gov.om
38	The Omani Centre for Investment Promotion & Export Development	https://www.ithraa.om
39	The Capital Market Authority	https://www.cma.gov.om
40	Majlis A' shura	https://www.shura.om
41	The Supreme Council for Planning	https://www.scp.gov.om
42	The State Council	www.statecouncil.om
43	The Research Council	https://www.trc.gov.om
44	The Administrative Affairs Council	https://www.caaj.gov.om
45	Oman Medical Speciality Board	www.omsb.org
46	The Tender Board	https://www.tenderboard.gov.om
47	The Secretariat General for Taxation	https://tms.taxoman.gov.om

48	The General Secretariat of the Cabinet of Ministries	www.oman.om
49	The General Secretariat of Higher Committee for National Day Celebrations	
50	Civil Services Employees' Pension Fund	https://www.civilpension.gov.om
51	Al Raffd Fund	https://www.alraffd.gov.om
52	The State general Reserve Fund	https://www.sgrf.gov.om
53	Oman Investment Fund	www.oif.om
54	Royal Oman Police Pension Fund	https://www.swfinstitute.org
55	Oman Housing Bank	https://www.ohb.co.om
56	Oman Development Bank	www.odb.com.om
57	Central Bank of Oman	https://cbo.gov.om
58	Muscat Securities Market	https://www.msm.gov.om
59	Muscat Municipality	https://www.mm.gov.om
60	Dhofar Municipality	www.dm.gov.om
61	The State Audit Institution	www.sai.gov.om
62	Internal Security	www.iss.gov.om
63	Majis Industrial Services Company	www.majis.om
64	Muscat Clearing & Depository	https://www.mcd.gov.om
65	Oman Chamber of Commerce and Industry	https://chamberoman.om
66	Oman Establishment for Press, News Publication & Advertising	http://mediate-oman.com/listings/oman-establishment-for-press-publication-and-advertising/
67	Oman Post	https://www.omanpost.om
68	The Public Establishment for Industrial Estates	https://www.peie.om
69	Public Prosecution	https://www.opp.gov.om/
70	Sultan Qaboos University	https://www.squ.edu.om
71	Royal Court Affairs	www.rca.gov.om
72	Royal Guard of Oman	www.mod.gov.om

73	Royal Office	www.mod.gov.om
74	Royal Oman Police	www.rop.gov.om
75	The Sultan's Special Force	www.mod.gov.om
76	Diwan of Royal Court	www.rca.gov.om
77	Governorate of Muscat	http://gom.gov.om/
78	Institute of Public Administration	ipa.gov.om
79	Office of the Ministry of State & Governor of Dhofar	https://www.omsgd.gov.om/
80	Sultan Qaboos Higher Centre for Culture	https://sqhccs.gov.om

Appendix F: Chi-square table.

DF	0.995	0.975	0.20	0.10	0.05	0.005
1	0.0000393	0.000982	1.642	2.706	3.841	7.879
2	0.0100	0.0506	3.219	4.605	5.991	10.597
3	0.0717	0.216	4.642	6.251	7.815	12.838
4	0.207	0.484	5.989	7.779	9.488	14.860
5	0.412	0.831	7.289	9.236	11.070	16.750
6	0.676	1.237	8.558	10.645	12.592	18.548
7	0.989	1.690	9.803	12.017	14.067	20.278
8	1.344	2.180	11.030	13.362	15.507	21.955
9	1.735	2.700	12.242	14.684	16.919	23.589
10	2.156	3.247	13.442	15.987	18.307	25.188
11	2.603	3.816	14.631	17.275	19.675	26.757
12	3.074	4.404	15.812	18.549	21.026	28.300
13	3.565	5.009	16.985	19.812	22.362	29.819
14	4.075	5.629	18.151	21.064	23.685	31.319
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
15	4.601	6.262	19.311	22.307	24.996	32.801

16	5.142	6.908	20.465	23.542	26.296	34.267
17	5.697	7.564	21.615	24.769	27.587	35.718
18	6.265	8.231	22.760	25.989	28.869	37.156
19	6.844	8.907	23.900	27.204	30.144	38.582
20	7.434	9.591	25.038	28.412	31.410	39.997
21	8.034	10.283	26.171	29.615	32.671	41.401
22	8.643	10.982	27.301	30.813	33.924	42.796
23	9.260	11.689	28.429	32.007	35.172	44.181
24	9.886	12.401	29.553	33.196	36.415	45.559
25	10.520	13.120	30.675	34.382	37.652	46.928
26	11.160	13.844	31.795	35.563	38.885	48.290
27	11.808	14.573	32.912	36.741	40.113	49.645
28	12.461	15.308	34.027	37.916	41.337	50.993
29	13.121	16.047	35.139	39.087	42.557	52.336
30	13.787	16.791	36.250	40.256	43.773	53.672
31	14.458	17.539	37.359	41.422	44.985	55.003
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
32	15.134	18.291	38.466	42.585	46.194	56.328
33	15.815	19.047	39.572	43.745	47.400	57.648

34	16.501	19.806	40.676	44.903	48.602	58.964
35	17.192	20.569	41.778	46.059	49.802	60.275
36	17.887	21.336	42.879	47.212	50.998	61.581
37	18.586	22.106	43.978	48.363	52.192	62.883
38	19.289	22.878	45.076	49.513	53.384	64.181
39	19.996	23.654	46.173	50.660	54.572	65.476
40	20.707	24.433	47.269	51.805	55.758	66.766
41	21.421	25.215	48.363	52.949	56.942	68.053
42	22.138	25.999	49.456	54.090	58.124	69.336
43	22.859	26.785	50.548	55.230	59.304	70.616
44	23.584	27.575	51.639	56.369	60.481	71.893
45	24.311	28.366	52.729	57.505	61.656	73.166
46	25.041	29.160	53.818	58.641	62.830	74.437
47	25.775	29.956	54.906	59.774	64.001	75.704
48	26.511	30.755	55.993	60.907	65.171	76.969
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
49	27.249	31.555	57.079	62.038	66.339	78.231
50	27.991	32.357	58.164	63.167	67.505	79.490
51	28.735	33.162	59.248	64.295	68.669	80.747

52	29.481	33.968	60.332	65.422	69.832	82.001
53	30.230	34.776	61.414	66.548	70.993	83.253
54	30.981	35.586	62.496	67.673	72.153	84.502
55	31.735	36.398	63.577	68.796	73.311	85.749
56	32.490	37.212	64.658	69.919	74.468	86.994
57	33.248	38.027	65.737	71.040	75.624	88.236
58	34.008	38.844	66.816	72.160	76.778	89.477
59	34.770	39.662	67.894	73.279	77.931	90.715
60	35.534	40.482	68.972	74.397	79.082	91.952
61	36.301	41.303	70.049	75.514	80.232	93.186
62	37.068	42.126	71.125	76.630	81.381	94.419
63	37.838	42.950	72.201	77.745	82.529	95.649
64	38.610	43.776	73.276	78.860	83.675	96.878
65	39.383	44.603	74.351	79.973	84.821	98.105
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
66	40.158	45.431	75.424	81.085	85.965	99.330
67	40.935	46.261	76.498	82.197	87.108	100.554
68	41.713	47.092	77.571	83.308	88.250	101.776
69	42.494	47.924	78.643	84.418	89.391	102.996

70	43.275	48.758	79.715	85.527	90.531	104.215
71	44.058	49.592	80.786	86.635	91.670	105.432
72	44.843	50.428	81.857	87.743	92.808	106.648
73	45.629	51.265	82.927	88.850	93.945	107.862
74	46.417	52.103	83.997	89.956	95.081	109.074
75	47.206	52.942	85.066	91.061	96.217	110.286
76	47.997	53.782	86.135	92.166	97.351	111.495
77	48.788	54.623	87.203	93.270	98.484	112.704
78	49.582	55.466	88.271	94.374	99.617	113.911
79	50.376	56.309	89.338	95.476	100.749	115.117
80	51.172	57.153	90.405	96.578	101.879	116.321
81	51.969	57.998	91.472	97.680	103.010	117.524
82	52.767	58.845	92.538	98.780	104.139	118.726
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
83	53.567	59.692	93.604	99.880	105.267	119.927
84	54.368	60.540	94.669	100.980	106.395	121.126
85	55.170	61.389	95.734	102.079	107.522	122.325
86	55.973	62.239	96.799	103.177	108.648	123.522
87	56.777	63.089	97.863	104.275	109.773	124.718

88	57.582	63.941	98.927	105.372	110.898	125.913
89	58.389	64.793	99.991	106.469	112.022	127.106
90	59.196	65.647	101.054	107.565	113.145	128.299
91	60.005	66.501	102.117	108.661	114.268	129.491
92	60.815	67.356	103.179	109.756	115.390	130.681
93	61.625	68.211	104.241	110.850	116.511	131.871
94	62.437	69.068	105.303	111.944	117.632	133.059
95	63.250	69.925	106.364	113.038	118.752	134.247
96	64.063	70.783	107.425	114.131	119.871	135.433
97	64.878	71.642	108.486	115.223	120.990	136.619
98	65.694	72.501	109.547	116.315	122.108	137.803
99	66.510	73.361	110.607	117.407	123.225	138.987
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
100	67.328	74.222	111.667	118.498	124.342	140.169
101	68.146	75.083	112.726	119.589	125.458	141.351
102	68.965	75.946	113.786	120.679	126.574	142.532
103	69.785	76.809	114.845	121.769	127.689	143.712
104	70.606	77.672	115.903	122.858	128.804	144.891
105	71.428	78.536	116.962	123.947	129.918	146.070

106	72.251	79.401	118.020	125.035	131.031	147.247
107	73.075	80.267	119.078	126.123	132.144	148.424
108	73.899	81.133	120.135	127.211	133.257	149.599
109	74.724	82.000	121.192	128.298	134.369	150.774
110	75.550	82.867	122.250	129.385	135.480	151.948
111	76.377	83.735	123.306	130.472	136.591	153.122
112	77.204	84.604	124.363	131.558	137.701	154.294
113	78.033	85.473	125.419	132.643	138.811	155.466
114	78.862	86.342	126.475	133.729	139.921	156.637
115	79.692	87.213	127.531	134.813	141.030	157.808
116	80.522	88.084	128.587	135.898	142.138	158.977
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
117	81.353	88.955	129.642	136.982	143.246	160.146
118	82.185	89.827	130.697	138.066	144.354	161.314
119	83.018	90.700	131.752	139.149	145.461	162.481
120	83.852	91.573	132.806	140.233	146.567	163.648
121	84.686	92.446	133.861	141.315	147.674	164.814
122	85.520	93.320	134.915	142.398	148.779	165.980
123	86.356	94.195	135.969	143.480	149.885	167.144

124	87.192	95.070	137.022	144.562	150.989	168.308
125	88.029	95.946	138.076	145.643	152.094	169.471
126	88.866	96.822	139.129	146.724	153.198	170.634
127	89.704	97.698	140.182	147.805	154.302	171.796
128	90.543	98.576	141.235	148.885	155.405	172.957
129	91.382	99.453	142.288	149.965	156.508	174.118
130	92.222	100.331	143.340	151.045	157.610	175.278
131	93.063	101.210	144.392	152.125	158.712	176.438
132	93.904	102.089	145.444	153.204	159.814	177.597
133	94.746	102.968	146.496	154.283	160.915	178.755
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
134	95.588	103.848	147.548	155.361	162.016	179.913
135	96.431	104.729	148.599	156.440	163.116	181.070
136	97.275	105.609	149.651	157.518	164.216	182.226
137	98.119	106.491	150.702	158.595	165.316	183.382
138	98.964	107.372	151.753	159.673	166.415	184.538
139	99.809	108.254	152.803	160.750	167.514	185.693
140	100.655	109.137	153.854	161.827	168.613	186.847
141	101.501	110.020	154.904	162.904	169.711	188.001

142	102.348	110.903	155.954	163.980	170.809	189.154
143	103.196	111.787	157.004	165.056	171.907	190.306
144	104.044	112.671	158.054	166.132	173.004	191.458
145	104.892	113.556	159.104	167.207	174.101	192.610
146	105.741	114.441	160.153	168.283	175.198	193.761
147	106.591	115.326	161.202	169.358	176.294	194.912
148	107.441	116.212	162.251	170.432	177.390	196.062
149	108.291	117.098	163.300	171.507	178.485	197.211
150	109.142	117.985	164.349	172.581	179.581	198.360
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
151	109.994	118.871	165.398	173.655	180.676	199.509
152	110.846	119.759	166.446	174.729	181.770	200.657
153	111.698	120.646	167.495	175.803	182.865	201.804
154	112.551	121.534	168.543	176.876	183.959	202.951
155	113.405	122.423	169.591	177.949	185.052	204.098
156	114.259	123.312	170.639	179.022	186.146	205.244
157	115.113	124.201	171.686	180.094	187.239	206.390
158	115.968	125.090	172.734	181.167	188.332	207.535
159	116.823	125.980	173.781	182.239	189.424	208.680

160	117.679	126.870	174.828	183.311	190.516	209.824
161	118.536	127.761	175.875	184.382	191.608	210.968
162	119.392	128.651	176.922	185.454	192.700	212.111
163	120.249	129.543	177.969	186.525	193.791	213.254
164	121.107	130.434	179.016	187.596	194.883	214.396
165	121.965	131.326	180.062	188.667	195.973	215.539
166	122.823	132.218	181.109	189.737	197.064	216.680
167	123.682	133.111	182.155	190.808	198.154	217.821
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.005**
168	124.541	134.003	183.201	191.878	199.244	218.962
169	125.401	134.897	184.247	192.948	200.334	220.102
170	126.261	135.790	185.293	194.017	201.423	221.242
171	127.122	136.684	186.338	195.087	202.513	222.382
172	127.983	137.578	187.384	196.156	203.602	223.521
173	128.844	138.472	188.429	197.225	204.690	224.660
174	129.706	139.367	189.475	198.294	205.779	225.798
175	130.568	140.262	190.520	199.363	206.867	226.936
176	131.430	141.157	191.565	200.432	207.955	228.074
177	132.293	142.053	192.610	201.500	209.042	229.211

178	133.157	142.949	193.654	202.568	210.130	230.347
179	134.020	143.845	194.699	203.636	211.217	231.484
180	134.884	144.741	195.743	204.704	212.304	232.620
181	135.749	145.638	196.788	205.771	213.391	233.755
182	136.614	146.535	197.832	206.839	214.477	234.891
183	137.479	147.432	198.876	207.906	215.563	236.026